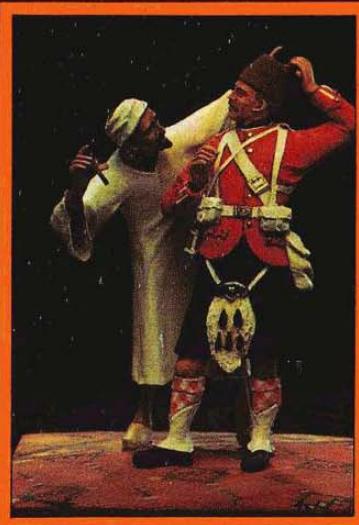


CHARTER  
ISSUE

# FineScale MODELER

FALL 1982 / \$2.25

T.M.



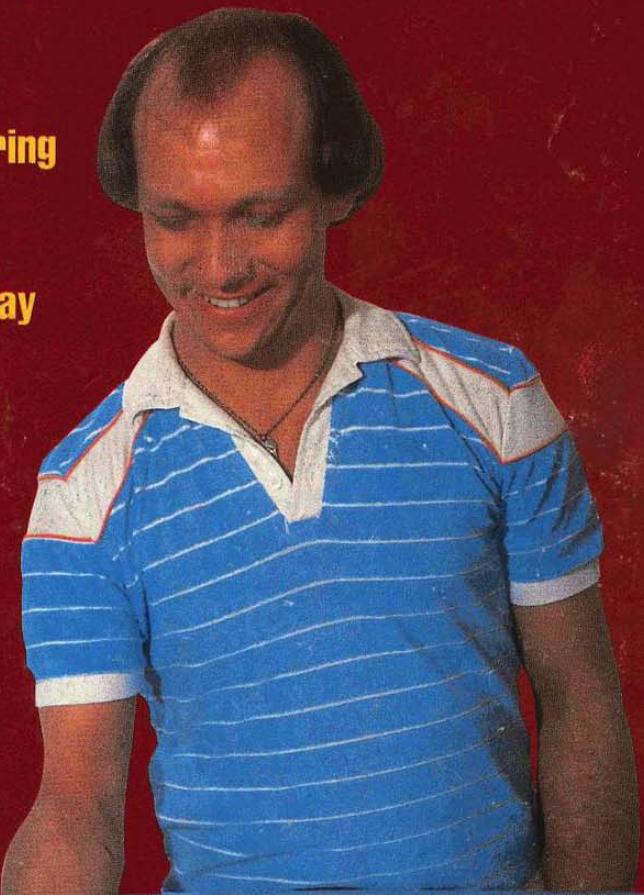
## How-to-do-it features:

**Building your first cast-metal car kit**

**Detailing and weathering a trio of WWII jeeps**

**Building a five-model scale reference display**

**Posing and painting "The Fez Seller" in 1/32 scale**



Introducing **5** new columns in this issue . . .  
including product news and in-depth kit reviews!



# INTRODUCING A SYSTEM OF ENAMELS GUARANTEED\* TO MATCH FS COLORS.

Authentic models require authentic paint schemes. To meet this need, Testor has developed a series of enamels guaranteed\* to match the most frequently used Federal Standard (FS) colors; the Model Master Custom Enamel System.

## How can Testor guarantee a perfect color match?

Rather than using 595-A, which is only a reference and not a color matching guide, Testor chemists developed working formulas after analyzing 3" x 5" official color chips issued by the General Services Administration (GSA). "Draw-downs" (test films of each batch of paint) were exactly matched to the GSA chips for color and specific reflectance measurements before the samples were approved.



## Why might Model Master colors not always match colors seen on actual equipment and vehicles?

Any color fades and changes when exposed to light and the elements. If you are building models of new equipment, Model Master enamels ensure authenticity. "In service" models must be authenticated by using weathering techniques in addition to Model Master colors.



## Can Model Master enamels be used in an airbrush?

Yes! We have formulated a special thinner for use in airbrushing. In addition, the ten most frequently sprayed FS colors are available in convenient 3.2 ounce spray cans.

## Can these paints be made flatter?

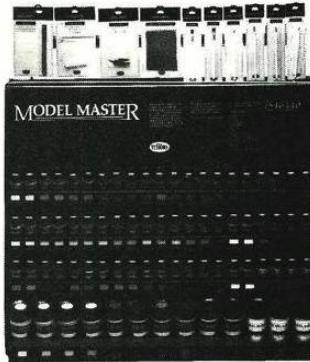
Absolutely! Simply mix in common talcum powder.

## Can they be made glossier?

No. The reflectance can, however, be changed by overspraying with one of the Model Master Protective Finishes: gloss, semi-gloss, lusterless (flat).



These coatings adhere to specific reflectance guidelines defined by the government.

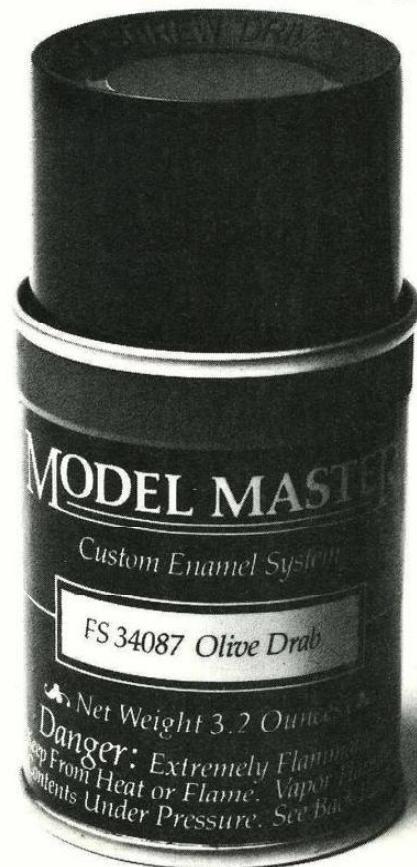


## Model Master Accessories:

In addition to the enamels, the Model Master system includes a line of precision tools designed specifically for modelling. Included are: assorted brushes, sanding films, Hobby Knife, Precision Cementing Tips and No. 11 refill blades.

Look for the Model Master rack at your local hobby shop. All the materials in this new system reflect our commitment to quality at every stage of production.

\*In some cases, the paint formula requires 6 to 7 pigments. Testor only guarantees a perfect match if you stir, not shake, the paint thoroughly before each use.



# FineScale MODELER

VOL. 1 NO. 1 FALL 1982

T.M.

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## ON THE COVER

Prizewinning modeler Larry Schramm has every right to be proud of the five Mustangs he built in five different scales. The story of why — and how — he built the models begins on page 26. Sharing the spotlight are Joe Berton's 1/32 scale "Fez Seller" vignette (page 20) and Wayne Moyer's cast-metal Mexican Road Race Ferrari in 1/43 scale (page 44). Photos by A. L. Schmidt, Lane Stewart, and Wayne Moyer.



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A dramatic two-figure vignette built from Airfix 1/32 scale multi-pose figures

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**Kits.** For \$3.00, Aerodrome Products, 3950 Third Avenue, Sacramento, CA 95817, sells a vacuum-formed 1/48 scale fuselage for the WWI German Albatros D-I, D-II, and D-III. Scale drawings are included.

Combat Models, 1633 Marconi Road, Wall, NJ 07719, has added the following vacuum-form kits to its line: McDonnell F-101 Voodoo in 1/32 scale for \$20.95, Martin PBM-5A (or PBM-3B) Mariner in 1/48 scale for \$22.95, German U-Boat Mk. VIIC in 1/72 scale for \$18.95, and U. S. S. *Barb* WWII fleet submarine in 1/72 scale for \$24.95. All kits contain detailed plastic parts and plans, although the modeler has to furnish such accessories as guns. Three other kits from Combat Models, all in 1/32 scale, are the Do 335A-1 and 6, \$20.95; Grumman F9F Panther, \$18.95; and North American FJ-1 Fury, \$18.95.

Recent releases from Imrie/Risley Miniatures, Inc., P. O. Box 89, Burnt Hills, NY 12027, are four 54 mm cast-metal figures representing Confederate soldiers in dress uniforms: Model C-90 is a rifleman of the Alexandria Rifles, 6th Battalion Virginia Volunteers, 1860; C-91 is a rifleman of the Republican

Blues, 1st Regiment, Georgia Volunteers, 1860; C-92 is a cavalryman of the 1st Virginia Cavalry Regiment, C. S. A., 1861-62; and C-93 is a ranger of Terry's Texas Rangers (8th Texas Cavalry), C. S. A., 1861-64. Each kit comes with painting instructions, a color reference card, and a brief history. Each sells for \$5.95.

LST Products, 5655 Beechnut, Box 157, Houston, TX 77096, manufactures a 1/35 scale bombed-out farmhouse, Kit No. M 102, appropriate for Western European settings from Napoleonic times to the present. The plaster model measures 6" x 8"; the price is \$14.95 plus \$2.00 for postage and handling.

Recent Tamiya kit releases from Model Rectifier Corporation, 2500 Woodbridge Avenue, P. O. Box 267, Edison, NJ 08817, include No. WS004, 1/350 scale Japanese battleship *Musashi* at \$54.98; No. 1404, 1/12 scale Yamaha RZ350 motorcycle at \$10.98; No. SS2419, 1/24 scale Toyota Turbo 2000VR sports car at \$10.98; No. 1405, 1/12 scale Yamaha Beluga 80 motor scooter, \$7.50; No. SS2424, 1/24 scale Renault 5 Turbo sports car for \$11.50; and No. SS2420, 1/24 scale Nissan Leopard TR-X Turbo sports car for \$10.98. Also available is a 1/6 scale Kawasaki KZ1300B motorcycle, No. BS0621, for \$84.98. For 1/35 scale armor enthusiasts and diorama builders there are Kit No. MM222A, an M4A3 Sherman tank for

\$10.98; No. MM-180, eight figures representing a WWII U. S. Army armored infantry rifle squad for \$3.98; No. MM221, WWII U. S. infantry weapons set, \$3.98; and No. MM219, U. S. 107 mm mortar with three crew figures, \$3.75.

Minicraft Models, Inc., 1510 West 228th Street, Torrance, CA 90501, announces the late fall release of three Minicraft/Hasegawa 1/48 scale kits of the F-4 Phantom, the F-4B/N, F-4C/D, and the F-4J/S. The firm will also introduce three 1/48 scale kits of the Hughes 500D helicopter in civilian, U. S. Army, and U. S. Navy versions. The other new kit is a 1/48 scale Type 52a Zero. Kit numbers and prices have not been announced.

Monogram Models, Inc., 8601 Waukegan Road, Morton Grove, IL 60053, will release several kits this fall. They include No. 5806, an F-105G Wild Weasel in 1/48 scale for \$6.75; three 1/16 scale truck models each for \$25.00, No. 2500, a Peterbilt 359, No. 2501, a Kenworth W-900, and No. 2502, a Kenworth W-900 Aerodyne; four 1/15 scale motorcycles each for \$5.50, No. 2414, a Honda Road Racer, No. 2415, a Harley-Davidson FXS-80, No. 2416, a Kawasaki Police 1000, and No. 2417, a Kawasaki Z550 LTD. A 1/20 scale model of the Ultra Z Camaro, No. 2413, is \$6.75.

Polk's Model Craft Hobbies, Inc., 346

## EVERYTHING FROM THE GROUND UP

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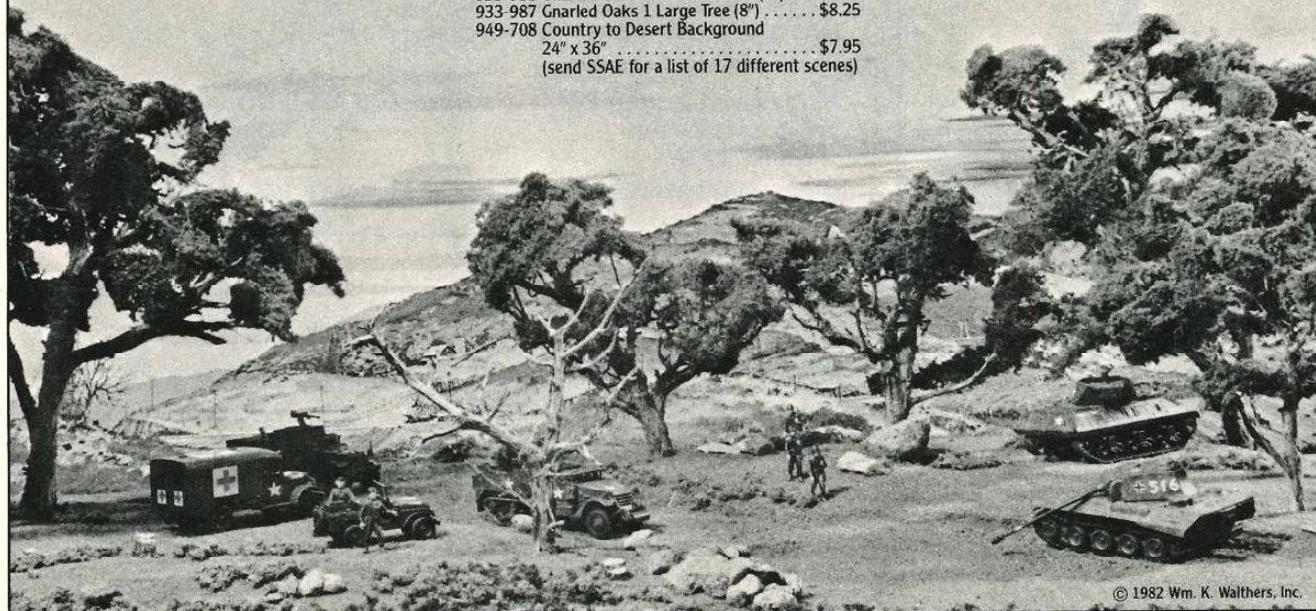
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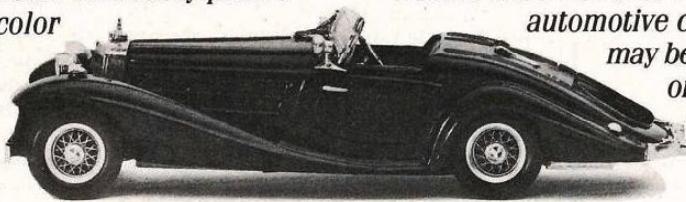
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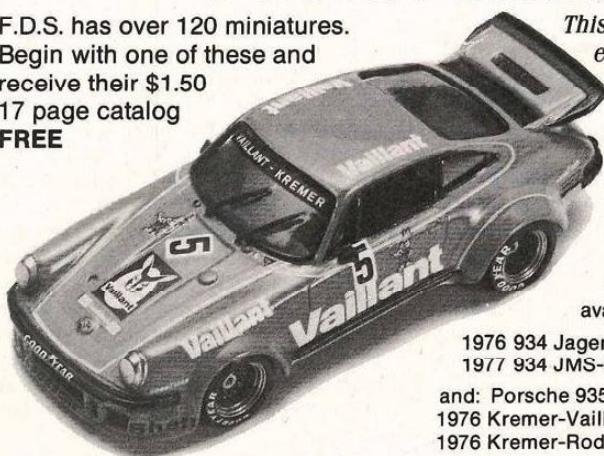
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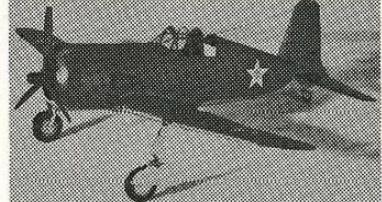
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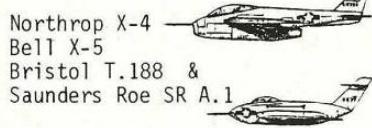
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Bergen Avenue, Jersey City, NJ 07304, announces the following new Heller kits for early fall: No. 762, 1/24 scale Renault 4 CV automobile; No. 813, 1/150 scale five-masted ship *Preussen*; No. 310, 1/72 scale Lockheed L749 Constellation with decals for Air France and TWA; and No. 713, 1/24 scale Citroën hotel taxi. Prices have not been announced.

Ral Partha Enterprises, Inc., 5938 Carthage Court, Cincinnati, OH 45212, announces the release of a cast-metal Imperial Dragon. This 25 mm scale figure is a limited edition; 6,000 will be sold in the U.S., 2,000 in Canada. The figure measures approximately 10" from head to tail, 6" from wing tip to wing tip, and sits atop a 1 1/4"-high treasure trove. It sells for \$50.00.

**Paints and adhesives.** Carl Goldberg Models, Inc., 4734 West Chicago Avenue, Chicago, IL 60651, now packages its Super Jet (gap-filling) and Jet (thin) cyanoacrylate cements in translucent plastic bottles with tapered nozzle tips. The tapered tip greatly reduces the chances of the nozzle clogging. Goldberg also claims a long shelf life for these cements. One-fourth-ounce bottles of Jet or Super Jet are \$1.95, 1/2-ounce bottles are \$2.95, 1 ounce are \$4.98, and 2 ounce are \$9.95.

M. Grumbacher, Inc., 460 West 34th Street, New York, NY 10001, announces that several of its products are now available in aerosol cans. They include Tuffilm fixative, matte; Damar varnish, matte; picture varnish, matte; and picture varnish, gloss. All four are available in two sizes — 12 1/2 ounces and 4 1/4 ounces — except picture varnish, which is 11 1/2 ounces only.

Pacer Technology & Resources, 1600 Dell Avenue, Campbell, CA 95008, offers Zap-a-Gap, a high-viscosity cyanoacrylate cement. Pacer says that Zap-a-Gap will bond oily, stained, or acidic surfaces. It's packaged in 1/4-, 1/2-, and 1-ounce bottles with clog-resistant tips. Prices are \$2.10 for 1/4 ounce, \$3.70 for 1/2 ounce, and \$6.95 for 1 ounce. Include \$1.00 per order for shipping and handling if ordering direct.

Pactra Industries, Inc., 7060 Hollywood Boulevard, Los Angeles, CA 90028, now offers 18 of its Authentic International Colors hobby enamels in 3-ounce aerosol cans.

The Testor Corporation, 620 Buckbee Street, Rockford, IL 61101, has released a line of Model Master enamel hobby paints. Available in 1/2-ounce bottles (\$1.29) and 3.2-ounce aerosol cans (\$2.29), the paints are formulated to match Federal Standard colors. There are 48 colors in the line, with varying degrees of gloss according to the reflectance of the Federal Standard color being matched.

Winsor & Newton, 555 Winsor Drive, Secaucus, NJ 07094, has introduced a

line of artist's paints with an alkyd binder. There are 34 colors in 1 1/4-ounce tubes. Winsor & Newton claims that alkyds combine the working qualities of oils with a much faster drying time. The alkyds can be worked for several hours, just like oils, but dry completely within 18 hours. The paints can be thinned with turpentine or mineral spirits.

Winsor & Newton has also added silver and gold metallic colors to its line of gouache paints. The paints contain aluminum and bronze particles and may be used alone or mixed with any of the 78 other Winsor & Newton gouache colors. They are sold in 30 ml jars.

**Accessories and landscaping materials.** Illinois Hobbycraft, Inc., 605 North Broadway, Aurora, IL 60505, sells 6" x 15" self-adhesive sheets with brick pattern and texture. Both standard brick and paving brick patterns are available in weathered and unweathered versions in 1/87, 1/48, and 1/12 scales. A package of two sheets is \$6.95, plus \$1.50 if ordered by mail.

Waldron Model Products, 1358 Stephen Way, San Jose, CA 95129, announces its racing car seat belt buckles. The buckles are available in 1/43, 1/24, 1/20, 1/16, 1/12, and 1/8 scales. The 1/8 and 1/16 scale buckles are \$3.25 per set, the others are \$2.85 per set.

**Tools.** Badger Air-Brush Co., 9128 West Belmont Avenue, Franklin Park, IL 60131, imports from England a self-adhesive masking material, Foto/Frisket, the firm claims is easy to cut and easy to remove. It's sold in packages of ten 8 1/2" x 11" sheets for \$7.00, in 12" x 15' rolls for \$12.00, and 24" x 15' rolls for \$22.00.

Binks Manufacturing Company, 9201 West Belmont Avenue, Franklin Park, IL 60131, offers its Raven double-action airbrush. All air and fluid seals are Teflon; the needle chuck is Delrin. The Raven is packed in a solid walnut box and comes with color cup, reamer, medium and fine needles, wrench, and airbrush hanger. The price is \$74.50.

Dremel, P. O. Box 518, Racine, WI 53406, offers its Model 1304 portable magnifying lamp with 4"-diameter lens and 40-watt incandescent bulb. The price is \$47.95. A weighted base (Model 1306) is available for \$16.95.

Dremel has also recently introduced a variable-speed flexible-shaft tool with a three-position switch that provides the option of going from a preset speed to 25,000 rpm at the flip of the switch. The flexible shaft is 34" long and its handpiece accepts all Dremel collets. Price is \$103.95.

Emcolux, 2050 Fairwood Avenue, Columbus, OH 43207, announces its Styrocut hot-wire cutter for Styrofoam and sheet plastic. The tool operates from a 6-volt lantern battery and cuts mate-

rial up to 2" thick. The cutter is \$6.95; packages of three replacement wires are \$1.50.

Falcon Safety Products, Inc., Dept. V, 1065 Bristol Road, Mountainside, NJ 07092, announces the Dust-Off II cleaning system, which consists of a 12-ounce aerosol can filled with a triple-filtered gas, a lockable valve, and a nozzle. Accessories include Stat-Off II, which attaches to the valve, and is said to eliminate static electrical charges on all surfaces; extension nozzles; and a Mini-Vac, which also attaches to the valve and removes dust. The Dust-Off II retails for \$24.95. Refill aerosol cans are \$4.50. The Stat-Off II attachment is \$17.95. A kit containing the Dust-Off II and all accessories is \$42.50.

The Gillette Company manufactures a new disposable scraping and cutting tool called the Widget, which consists of a plastic dispenser and handle that holds a special stainless steel single-edge blade, and includes a compartment for used blades. Each Widget comes with five blades. The introductory price is 99 cents.

M. Grumbacher, Inc., 460 West 34th Street, New York, NY 10001, manufactures a red sable round brush, 178-10/0, that sells for \$2.50.

Jarmac, Inc. P. O. Box 2785, Springfield, IL 62708, announces its all-metal  $\frac{3}{16}$ " drill press. It comes with a 5,000 rpm,  $\frac{1}{16}$  hp motor and a  $\frac{1}{4}$ " Jacobs chuck. The drill height adjusts up to 7" from the base on a 14" post. It has a 4" throat, and the drill bit will travel 2" when using the lever.

The 6" x 6" base has two mounting holes and rubber pads on each corner. Price: \$109.50, plus \$3.00 freight. A foot-operated speed control (No. 4001) is also available for \$25.50.

Maxon, P. O. Box 243, Carlstadt, NJ 07072, now sells a packet (No. H86) of carbon-steel twist drills containing one each No. 50, 56, 60, 65, 70, and 76 drills, the six sizes most often used by hobbyists; the price is \$3.85.

Microflame, Inc., 3724 Oregon Avenue South, Minneapolis, MN 55426, manufactures the Dragon gas torch, which features a hand-held control lever for flame adjustment. Microflame states that the lever is an important safety feature because the flame is extinguished whenever the lever is released. The torch uses disposable gas cylinders, which last up to four hours. The fuel is 49-percent butane, 51-percent propane (by weight), and produces a 2,500-degree F. flame, so the torch may be used for soldering and brazing. A torch and one gas cylinder sell for \$19.95; replacement 9-ounce gas refills are \$6.95 each.

Stacor Corporation, 285 Emmet Street, Newark, NJ 07114, has introduced the Tritec taboret, a rolling plastic and metal storage cabinet that is 16" wide, 16 $\frac{3}{4}$ " deep, and 29" high. The taboret

contains bins, shelves, and trays which can be arranged to hold a variety of objects including bottles, cans, small tools, and drafting aids. The taboret retails for \$242.00; contact Karen M. Gross at Stacor for addresses of local dealers.

Sutcliffe Productions, Westcombe, Shepton Mallet, Somerset, England, manufactures dark gray styrene streamlined strut stock for 1/72 scale model aircraft. Each package contains ten 12" lengths ranging in width from about  $\frac{1}{16}$ " to  $\frac{1}{4}$ ". North American modelers may purchase the strut stock from Dabar Depot, 13407 Wales Creek Road, South Wales, NY 14139, for \$2.50 plus \$.50 postage and handling.

Virnex Industries, Inc., Rt. 1, Box 154B, Reedsburg, WI 53959, manufactures decal sets containing geometric shapes such as diamonds, squares, and rectangles in sizes ranging from less than  $\frac{1}{4}$ " to more than an inch. Each  $5\frac{7}{8}$ " x  $8\frac{1}{4}$ " sheet sells for \$2.75. Several colors are available.

**Miscellaneous.** The Gateway Chapter of IPMS, which hosted the 1982 national convention, prepared an anthology of articles from its quarterly journal for distribution at the convention. Titled *The Best of Crazed Plastic*, this 60-page,  $8\frac{1}{2}$ " x 11", soft-cover book is now available for \$4.00 (which includes postage) from the chapter, care of Dave Venker, 1554 Louisville, St. Louis, MO 63139. The book contains useful how-to modeling information and many scale drawings.

Model & Allied Publications, Ltd., P. O. Box 35, Bridge Street, Hemel Hempstead, Herts., HP1 1EE, England, announces *Scale Models Warplane Special*, a 96-page (12 in color), single-issue magazine containing drawings, photos, and text about the Fokker DRI Triplane, Yugoslavian Bf 109Gs, Grumman Hellcat, BE2C/E, Convair Privateer, Sopwith F1 Camel, Fairey Fulmar, Handley Page Heyford and Victor, Hawker Sea Fury, and F-16 Fighting Falcon. According to the publisher, more than 80 percent of the contents were prepared especially for this issue. The price in North America is \$3.00.

Scalecraft, P. O. Box 4231, Whittier, CA 90607, publishes 24" x 36" 1/25 scale five-view drawings of the Focke Wulf Fw 190F-8, Messerschmitt Me 262A-1a, Fw 190D-9, Focke Wulf Ta 152H, and Messerschmitt Me 109G and K. The Me 262A drawings are on two sheets and sell for \$7.00; the others are on single sheets and sell for \$5.00 each. Prices include first-class postage; add \$2.00 per order for rolled drawings.

World War 1 Aeroplanes, 15 Crescent Road, Poughkeepsie, NY 12601, a society of enthusiasts interested in pre-1919 aircraft, offers a sample copy of its journal, *W. W. 1 Aero*, for \$4.00.

**Catalogs.** Aero Publishers, Inc., 329

West Aviation Road, Fallbrook, CA 92028, offers a free catalog listing more than 200 aviation-related books, many of which contain text, photos, and drawings of interest to scale modelers.

Aviation Book Company, 1640 Victory Boulevard, Glendale, CA 91201, has prepared a free catalog listing 1,200 aviation-related books.

Castings, P. O. Box 3482, Longwood, FL 32750, manufactures an extensive line of reusable silicone rubber molds for toy soldiers and 1/32 scale (54 mm) figures, special casting metals, stoves, ladles, and other supplies. A free catalog is available.

Empire Pacific, Ltd., 18027 Clarkdale Avenue, Artesia, CA 90701, offers a free catalog listing a number of Japanese aircraft, tank, ship, motorcycle, and car kits from such manufacturers as Sharp, Yodel Model, Yamada, Aoshima, and Nagano Model.

Imrie/Risley Miniatures, Inc., P. O. Box 89, Burnt Hills, NY 12027, offers catalog No. 148 listing their cast-metal military figures, most in 1/32 scale (54 mm). The catalog costs \$2.50.

Jet Set System, 549 G La Rambla, Ponce, PR 00731, has a new catalog listing airliner kits, decal sets, and books. It sells for \$1.00.

Krasel Industries, Inc., 1821 East Newport Circle, Santa Ana, CA 92705, offers a 78-page catalog listing the firm's 1/32, 1/48, 1/72, and 1/144 military and civilian aircraft decals. The cost is \$1.00.

Mail-Call Models, 1525 West MacArthur Boulevard, No. 20, Costa Mesa, CA 92626, has a 40-page catalog of plastic kits, tools, paints, books, and accessories of interest to modelers. The catalog sells for \$3.00.

Model Car Masterpieces, 1525 West MacArthur Boulevard, No. 20, Costa Mesa, CA 92626, offers a catalog of 1/43 scale cast-metal model car kits, which includes products by such manufacturers as Precision Miniatures, Western Models, and Modelcar Danhausen. The catalog costs \$2.00.

The Naval Institute Press, U. S. Naval Institute, Annapolis, MD 21402, has released its free Fall 1982 catalog of books relating to naval affairs, ships, and aircraft.

Science Books International, Inc., 51 Sleeper Street, Boston, MA 02210, offers a free catalog listing books from Jane's Publishing Company, which Science Books now distributes in North America.

Squadron Mail Order, 1115 Crowley Drive, Carrollton, TX 75006, has released its 40-page Summer 1982 catalog of books, kits, tools, and accessories. The catalog costs \$1.00.

**FSM**  
FSM invites manufacturers and publishers to submit news releases, photos, product samples, and new catalogs. Send all material to FSM Update, FINESCALE MODELER, 1027 North Seventh Street, Milwaukee, WI 53233.



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## FSM READER FORUM

Let us know what you think! Comments, suggestions, corrections, and additional information on FSM articles are welcome in this column. Letters submitted for publication should be clearly marked "To the Editor" on both the envelope and the letter, should be typed or hand-printed, and should be no more than 300 words long.

**FSM's test issue.** I reserved a copy of the trial-run first issue of *FINE SCALE MODELER* at my hobby dealer (Maker's Hobby) here in Abilene, and today I picked it up. I was very impressed!

The articles presented in this first issue, although merely the tip of the iceberg, are fairly representative of what we modelers out here in the hinterlands have been needing. Even though the average modeler is not about to try (or want) to duplicate Paine's "Nelson diorama" or Twist's "Prince and his pony," there is still modeling knowledge to be gleaned from the articles.

Taking you at your editorial word that you would like input, I would like to make the following comments.

First: Do not fall into the trap of the other publications and clutter up the modeling articles with excessive photos and narration of prototypes. Pictures needed to illustrate or emphasize a point may be necessary, but a modeler wanting in-depth prototype information can most generally find it available through other sources.

Second: When presenting construction articles (conversion, vacuum-form, etc.), please include drawings to clarify what is being accomplished, where possible. Although it may be called copy-cattting the fine British publication *Scale Aircraft Modelling*, I would like to see an article on vacuum-form construction or a conversion (perhaps both!) run in each issue.

Third: When mentioning trade names of materials, please give some indication of where these materials (or a like substitute) can be obtained. Many a time, a trade-name product found to be of use to a particular modeler may not be available in other local areas, or may be known by another name.

My hobby dealer has informed me that you plan to publish quarterly issues, but has no word on when the next issue will be published to begin them. I am looking forward to the next issue and hope it is not too long a wait!

In the interim, here's wishing you all success with this new venture.

*Fred J. Helmick*  
Abilene, Tex.

I personally would like to see modeling articles on historic racing cars. How about that 1970 Lemans winner,

Porsche 917, and the green and purple one also, painted in that wild scheme?

The older series of American racing cars would also be interesting, and a real challenge! I'm thinking of the older dirt track sprint cars, and board track racers of the '20s and '30s.

I feel that a couple of other areas have been really neglected — the civil aviation sector in all time periods, especially the '20s, '30s, and '40s, and experimental aircraft of any period, civilian or military.

Lastly, let's see a monthly and hang up the quarterly idea! Good grief! One of life's simple pleasures is hitting the magazine racks at the hobby shops each month for the goodies; the interlude there is already too long! Three months? Absolutely, positively unbearable!

And how about following the lead from *Scale Models* in the UK by putting subscription issues in a brown envelope? I truly dislike mailing labels indiscriminately slobbered all over the front cover, and then read by half the personnel of the Post Office. Let them get their own subscription!

R. D. Holley  
Van Nuys, Calif.

[We'll be including racing cars and civilian aircraft in future issues, R. D., and subscription copies will be mailed in envelopes. As for monthly issues, before I can satisfy that request we need a larger staff to produce the magazines and a cabinet full of high-quality articles to fill them with. We're working on both. — B. H.]

**NASM's Fw 190F.** I was especially interested in the article by Ernest Pazmany detailing his construction of a Fw 190F-8 model based on the current restoration now being undertaken by the NASM.

Production of the Fw 190F-8 began in March 1944 and continued until the end of the war with about 4145 machines being built. An additional several hundred were manufactured from older airframes of the A-series. Apparently, the NASM's aircraft is one from the latter category.

I note that Ernie suggests mottling the model's side surfaces with two colors: 02 and 75. While all of us recognize that almost anything was possible in late-war German paint schemes, it should be noted that the use of color 75, gray-violet, as a fuselage mottle was not authorized. In most cases, Focke Wulf 190s used a two-color fuselage mottle and, in the case of the late war production machines, it seems much more likely that these two colors were based on the new regulations. As a case in point, the aircraft shown at the top of page 40 in our *Official Painting Guide to German Aircraft* were mottled in brown violet 81 and a dark green. Incidentally, we are currently working on

*Monogram Close-up 8* detailing the story of the Fw 190F. Publication is slated for later this year.

Thomas H. Hitchcock, Publisher  
*Monogram Aviation Publications*  
Boylston, Mass.

**A fine scale idea.** I have just finished reading the Spring 1982 issue of *FINE-SCALE MODELER* and I have found it to be a fine magazine. However, I do have one suggestion: please print your aircraft drawings in accepted aircraft scales (1/72, 1/48, or 1/32), as this will permit modelers without photographic enlargement or reduction capabilities to work directly from them. Thank you for your time and good luck with your magazine.

Woody Straub  
Pittsburgh, Pa.

[A fine idea, Woody, and from now on we plan to run all drawings in a common modeling scale, with the grid pattern behind them keyed to a scale measurement. In fact, if you'll check the Supermarine Walrus drawings on pages 30 and 31, you'll find we've already started! — B. H.]

**Sommerfield's Sea Fury.** Just a few things on the RAN Sea Fury article in *FSM* No. 1 by Ken Sommerfield. Firstly, on page 26 Ken states that the Sea Fury served with WH587 Squadron, RAN. There was no such squadron as WH587; this was a manufacturer's number. Also, he said that the K number was missing from the vertical stabilizer and therefore meant that the aircraft was never based on a carrier. In fact, the K was the designation letter for the carrier HMAS *Sydney* while the letter M was for HMAS *Melbourne*. The

shore-based letters were NW for Nowra air base and these appeared on the vertical stabilizer as well.

Regarding the kangaroo on the roundel of RAN Sea Furies as far as I can check through my extensive records, the 'roo never appeared on the Sea Fury and we used standard British roundels per the photo on page 24/25.

The color renditions of the Sea Fury on page 26 are superb, very accurate, and I pass my compliments to Ken for a fine article. Please don't think I'm nitpicking, I just thought he may like some more information.

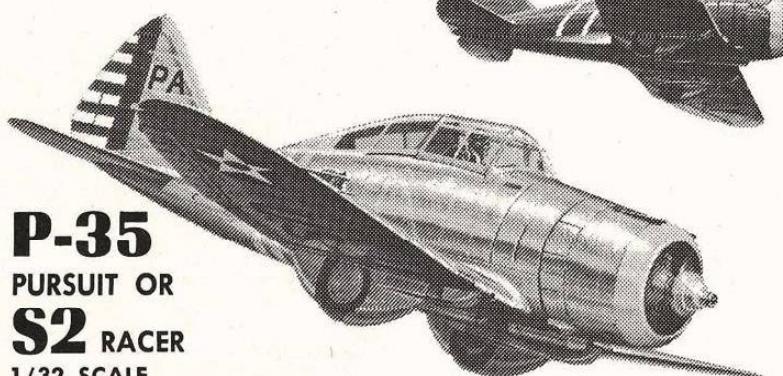
Tim Vickridge  
Fremantle, Western Australia

[Thanks for the information, especially the explanations of the tail letters. As to the kangaroo inside the roundels, this appears clearly in an official RAN photo of the plane while it was in service. In fact, this photo shows that the present owner of Sea Fury WH587 has (with the exceptions Ken mentioned) preserved the markings of the plane as it appeared while serving the RAN. The photo in question was reproduced on page 20 in *IPMS Quarterly*, Vol. 2, No. 2. — B. A.]

**Correction.** [Several readers pointed out that the address for Bill Koster's Koster Aeronautical Enterprises was incorrect in the Spring 1982 test issue of *FSM*. This is the source of the conversion kit that Ernie Pazmany used to build his model of the NASM Fw 190F-8. To complicate matters further, Bill has since moved. We're sorry for the mistake. The current, *correct* address for Koster Aeronautical Enterprises is 233 East Ellis Avenue, Libertyville, IL 60048. — B. H.]

FSM

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**Every FSM Workbench Review is a first-hand report by a modeler who has actually built the kit or used the product. While our reviewers are encouraged to compare the products to similar ones in their experience, evaluation is of secondary importance; the reviewer's primary goal is to provide a detailed description of the product so FSM readers can evaluate it for themselves. Models shown in Workbench Reviews are built straight from the box.**

**Kit:** No. 6301, Grumman F-14A Tomcat  
**Scale:** 1/32

**Manufacturer:** Tamiya, imported by Model Rectifier Corporation, 2500 Woodbridge Ave., Edison, NJ 08817  
**Price:** \$69.95.

TAMIYA'S TOMCAT is a large kit with a lot of parts — 333 of them on seven trees. Most parts are molded in light gray plastic which I found neither unusually hard nor soft compared to other kits. The model is broken down into the forward fuselage (cockpit section); lower fuselage; upper rear fuselage; upper main fuselage containing the support for the wings and their gear mechanisms; wings, ordnance, fuel tanks and their mountings; and landing gear.

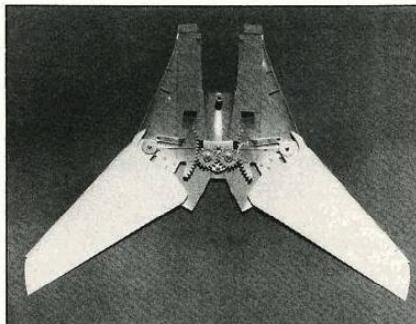
Perhaps the most noteworthy parts are the metal support plate, screws, washers, and brass bushings for the folding wing mechanism and the wire support rods that strengthen the landing gear to support the weight of the completed model (about 2½ pounds). The multicolored decal sheet measures 8" x 15" and provides markings for a VF-211 aircraft operating from U. S. S. *Constellation*, a VF-84 aircraft from U. S. S. *Nimitz*, and an Iranian Air Force version. The kit includes three figures: pilot, NFO, and catapult crewman.

My evaluation of the parts before construction was that they are well above average, with excellent detail. The landing gear assemblies are little kits in themselves (with 15 parts each, not including the rubber tire), and the same goes for the ejection seats, which contain 16 parts each. The only flaw I found was a small crack near the back of the clear canopy, part G4, which the manufacturer replaced promptly in response to a written request.

The 16-page, 8" x 12" instruction booklet breaks assembly down into 36 clear and concise steps illustrated with 22 photos and several dozen drawings and sketches. Painting and decal application instructions are included. All assembly options are clearly explained. The box art (a painting) qualifies as part of the instructions, since it could be helpful in painting or decaling the



All photos, FINESCALE MODELER: A. L. Schmidt



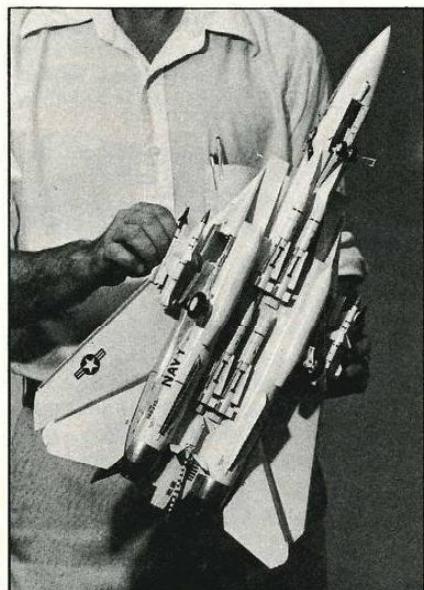
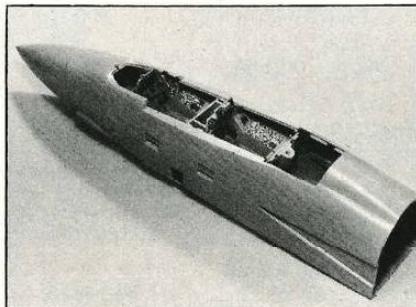
kit if you're not familiar with paint schemes and markings.

For the most part I followed the instructions exactly, but I did build up and paint the landing gear, ordnance, and ejection seats as subassemblies just to save time. The only problem I had with fit was where the forward fuselage section joined the upper main fuselage. There was a little offset that had to be corrected there, so I filed and sanded the fuselage spine to even out and match up the body lines and contours as much as possible. I then leveled it with putty to eliminate high or low spots. The only other minor fit problem was where the jet intakes glue to the lower fuselage. Again, the offset was filed away and putty used to level it out.

While the kit can be built quite adequately simply by following the instructions, if I were to assemble this kit again I would reverse the order of steps

11 and 12. As written, there is a possibility of creating a gap of up to ¼" between the forward fuselage section and the main fuselage assembly, which is what happened to me. By reversing the order of the steps you can fit the forward section more closely after the upper main fuselage assembly is glued in place.

The swing-wing mechanism is accurately made, presents no difficulties in assembly, and works fine. Three sets of parts are provided for the intake ramp



assemblies so that they may be modeled in the subsonic, transonic, or supersonic positions. I chose the subsonic position.

I checked my completed model against drawings and specifications listed in Bert Kinney's *F-14 Tomcat in Detail and Scale* and found it accurate. Scale thicknesses, especially where molded parts are exposed edge-on, are also very close.

Besides the minor fit problems mentioned earlier, my only complaint with the kit is the lack of molded detail on the instrument panels and consoles. True, the decals provided are nice, but why stop there when so much time has been devoted to detail on the rest of the kit? If I assembled this kit again, I would devote much more time to cockpit details, including straps on the seats, scratchbuilt consoles and instrument panels, and oxygen hoses.

I was particularly impressed with the overall level of detail on this kit, especially the landing gear, wheel wells, ordnance, and ejection seats, and the excellent fit of the parts. Although I spent 100 hours on my model, it didn't seem that long because of the ease with which the parts went together. For a model of this size and number of parts, everything fit like a glove, and I'd recommend this kit to a friend, as long as he had some modeling experience under his belt.

*Larry Schramm*

**Kit:** No. PK-176, Char B.1 bis and Renault FT.17 tanks

**Scale:** 1/76

**Manufacturer:** Matchbox, Lesney Products P.L.C., London, England

**Price:** \$5.50.

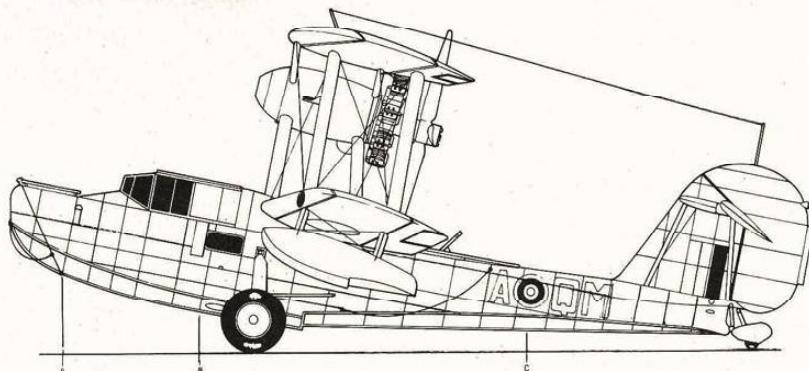
THIS KIT PROVIDES parts to build two early French tanks: a tiny 6.8-ton Renault FT.17 of WWI and a between-the-wars design, the Char B.1 bis. Both vehicles saw some service in the early days of WWII. Parts are also included to build a simple, 2½" x 7¼" setting depicting a road and a ruined building.

The kit is made of styrene and has rubber tracks. Matchbox likes to mold its kits in some of the basic colors that the vehicle or plane would have been painted, and in this kit the bulk of the superstructure parts are olive green, with the suspension in ochre. The flexible track is steel-colored, and the four figures, road, and ruins are brown. The five sprues contain 81 parts. The decal sheet measures 3" x 3" and is printed in white, red, and blue.

I consider the parts above average. Surface detail is crisp, delicate, and realistic. Most mold marks are on the inside surfaces of the parts.

The four pages of instructions include 21 steps illustrated with drawings and sketches. The painting instructions are extremely detailed, with three sets

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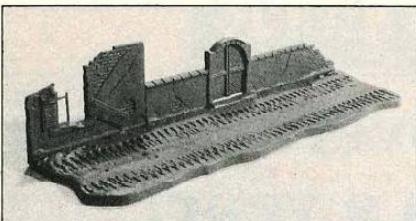
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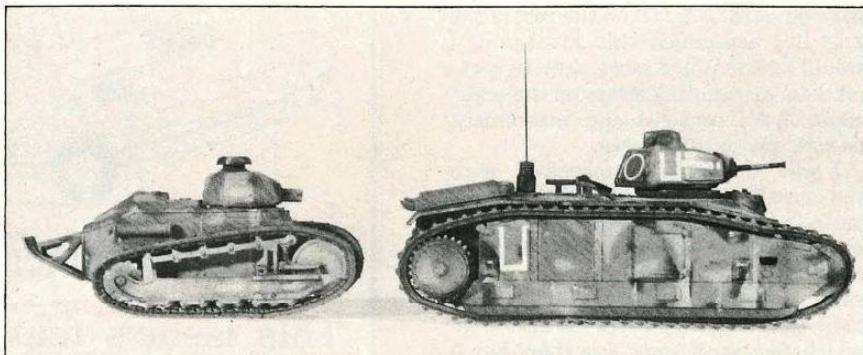
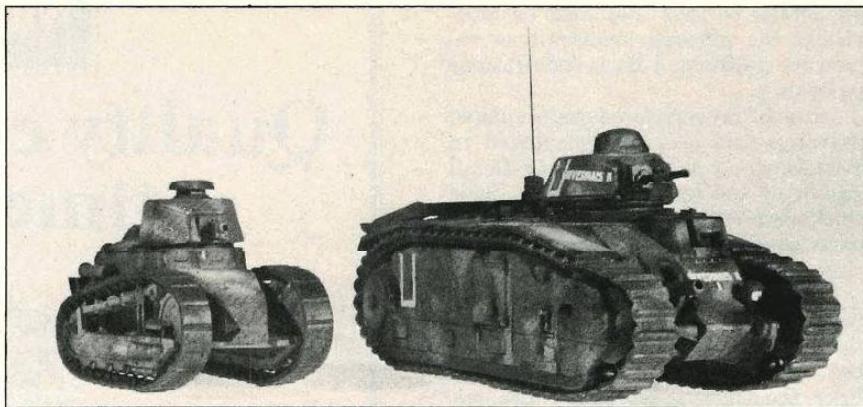


of top, side, front, and back views for each tank. The color artwork on the back of the box supplements the black-and-white drawings and painting keys, so the instructions are better than most concerning painting information.

I built the kit according to the instructions, with the sole exception of painting the mufflers separately before adding them to the tanks. (Mufflers tended to rust and scorch badly, and I didn't want to paint them the same colors as the hulls.) A few light mold marks on the guns, mufflers, tools, and handrails must be sanded off. The only minor problem I encountered was in gluing parts 4 and 6, the front fenders, to the Char hull. If you don't align these pieces correctly, you'll have trouble sliding the tracks into place.

The fit of all parts was excellent with the exception of the commander's seat hatch on the Char. After gluing it in place, I noted a gap which I filled by painting it with white glue. I also had to do a small amount of sanding on some of the joints in the Renault turret. The tracks on the Renault must be glued to the return rollers on top of the suspension system to keep them from bulging up. I also drilled out all gun barrels.

I don't have any documentation on these tanks, so I don't know how close



the models are to scale. The overall proportions are good, and the thicknesses of most parts appear correct, although I did replace the Char's antenna (which was about as thick as the 47 mm gun) with a piece of stretched sprue. For scale reference material I used *Profile No. 36, AFV Weapons on the Char's Hotchkiss, H-35 and H-39, and Somua S35*. The Somua used the same turret as the Char; other components also appear similar.

These models are among the best 1/76 or 1/72 armored vehicles that I have built. I particularly like the realistic appearance of the tracks and the locking feature which allows them to be joined securely. I spent 10 hours building the two tanks, which I rate as about average for me for this scale vehicle, and I think even a beginner with only a few kits under his belt could turn this kit into a pair of attractive early armor models.

Dennis Moore

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**Kit:** No. 1187, Lockheed SR-71A Blackbird

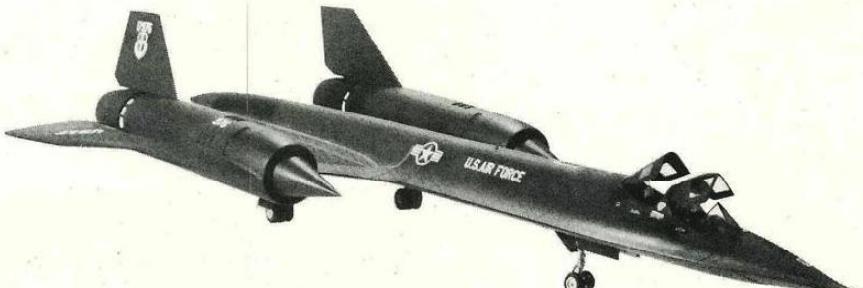
**Scale:** 1/72

**Manufacturer:** Hasegawa, imported by Minicraft Models Inc., 1510 West 228th St., Torrance, CA 90501

**Price:** \$8.00.

THE SR-71 is a fascinating subject, and lately it seems as though every manufacturer in the modeling field has decided to offer a kit of it. Hasegawa's version is certainly among the better ones.

The kit is molded in black styrene and consists of only 43 parts on two sprues. Most of the fuselage and wing is composed of only two pieces, upper and lower. In addition, there is a simple cockpit assembly, the undercarriage assembly, and fore and aft engine assemblies. Most panel lines are raised, and the corrugated skin panels on the wings are accurately represented. Small parts are detailed and to scale. I compared the parts to the pictures of the SR-71A in the October



1974 issue of *Air International* and they match up nicely.

The clear parts were also well molded, but had scuffed areas that I polished out with Blue Magic metal polish cream (Blue Magic, P. O. Box 3145, Long Beach, CA 90803). The 7 3/4" x 3 1/2" decal sheet was printed in red, white, green, yellow, and black.

The instructions consist of four pages measuring 8 1/4" x 11". There are eight construction steps, each illustrated with a drawing, one photo of the finished model, and a detailed three-view drawing that shows where to place all

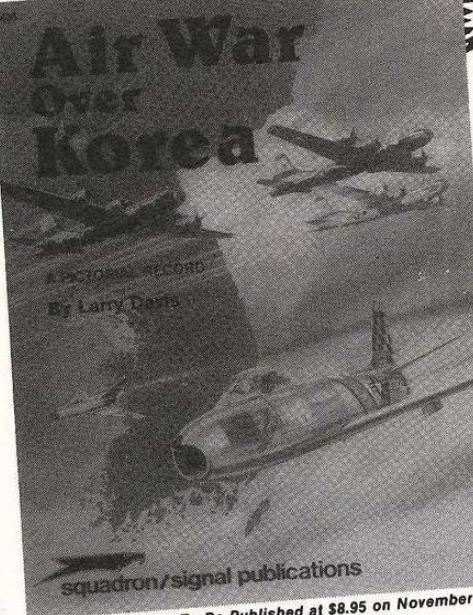
decals. The painting directions are especially well done, and they include the FS (Federal Standard 595a) numbers for the required colors as well as an address for obtaining an FS color chip book. A brief history of the plane is provided and the correct color of each part is listed.

Assembly is easy. I found small amounts of flash on the tip of the tail and shoulder of the wing, and I had to remove mold marks from the edge of the upper half of the fuselage and wing piece. There were also some heavy mold marks on the wheel well doors

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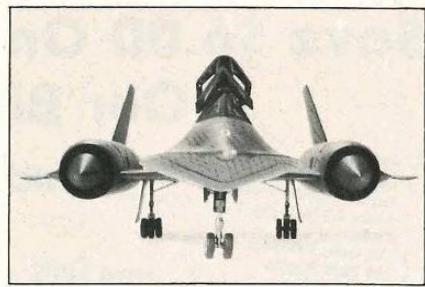


which had to be sanded off. I deviated from the instructions by adding the nose assembly after applying the decals. I was afraid of breaking the nose probe.

The openings of the air intakes did not fit well and so I had to putty them; the same is true of the tail. The two vertical stabilizers have small gaps under them that can be closed by painting white glue into the seam.

The completed model scales out exactly in the major dimensions of wingspan, length, and height, and scale thicknesses of all parts were fine except for the canopies (a purist might want to replace them with vacuum-formed parts). Overall detail is excellent, and if I were to assemble this kit again all I would add is seat belts, a throttle, and Kristal-Kleer lights.

The least satisfactory part of this kit was the decal sheet, which provides markings for three planes of the 9th Strategic Reconnaissance Wing, Beale AFB, California. Although they are well printed, very detailed, and settle nicely using the Microscale system, they have a horrible bluish adhesive. After soaking each decal section from its backing I had to hold the film on my finger while wiping off the adhesive. This was time-consuming and tricky, but necessary so that the adhesive



would not cloud all the clear areas of the decals.

This kit rates high marks for its excellent detail and the delicate molding of its small parts. All in all, it's an easy aircraft kit to build — it took me 14½ hours, but the decals accounted for about 2 hours of that — and were it not for the adhesive problem with the decals I would gladly recommend this kit to a beginner.

Dennis Moore

**Kit:** No. 682, McDonnell Douglas RF-4C or E Phantom II

**Scale:** 1/72

**Manufacturer:** Italeri, imported by The Testor Corporation, 620 Buckbee St., Rockford, IL 61101

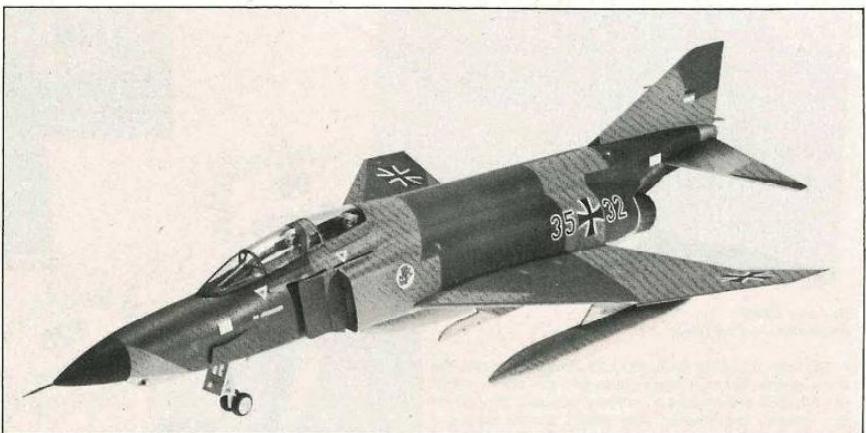
**Price:** \$6.00.

THIS PHOTO RECON version of the Phantom II is the first truly new 1/72 scale model of the F-4 to come along in quite some time. There are 63 parts on three sprues, all but a few of them crisply molded in green styrene of average hardness.

The nose section is molded separately from the fuselage, which would seem to indicate plans for another version with common parts later on. The rest of the fuselage and cockpit follow normal kit design. The wing section consists of three pieces and attaches to the bottom of the fuselage. Optional parts are provided for the C and E variants, along with spare components for items that differ among the American, Japanese, and German air forces. The panel lines are raised and quite delicate, as are most other surface details.

The small parts, including the cockpit parts, are nicely detailed. However, the clear parts are less satisfactory. They have scratch-like flaws molded into the plastic that are visible at close range, and the surface of the canopy includes minor distortions.

The kit includes a 4½" x 4½" sheet of Microscale decals printed in red, black, blue, white, and yellow that furnishes markings for a West German or Japanese RF-4E or a U. S. Air Force RF-4C. Unfortunately, the box photo shows decals on the consoles next to the pilot's and navigator's seats, which are missing from the sheet. Page 36 of the January 1980 *Air International* shows the nose of Luftwaffe RF-4E from Aufkl. 6-



51 with a diving bird of prey on the nose and another bird marking on the intake baffle; these also are missing from the sheet.

There are 12 8½" x 11" pages of instructions, and they are among the most detailed I have seen. Included are a brief history, specifications, bibliography, detailed painting instructions with FS numbers, weathering hints, four photos, decaling instructions, and three pages of three-view drawings of the American, West German, and Japanese versions of the plane. The box art provides a total of 10 color photos of models built in the U. S. and German schemes.

Although the eight-step assembly sequence is excellent, I would make the following minor suggestions. The camera windows in the nose, although well molded, are bunched in the area of four major seams. Unless you want to go crazy masking and polishing out sanding scratches, I suggest substituting Micro Kristal-Kleer for the clear parts.

The overall fit of the parts was excellent except in the nose area and around the air scoops; you also will have a lit-

tle filling to do under the wing in the fold seam. To ensure a snug fit along the fuselage, sand down the air channel triangle that parts Nos. 25 and 33 are glued over. To prevent breakage, don't glue the nose probe on until the kit is finished. I added the landing gear and wing tanks after painting.

It took me 14 hours to complete the kit, including painting. The model compares favorably with the specifications given in the instruction sheet, and in areas where molded parts are exposed edge-on the appearance is generally excellent. The most unsatisfactory part of the kit was the canopy, which could have been molded better. I had planned to build the model with the canopy open, but discovered that it did not come with hinges. There are gaps in the cockpit between the seat-floor assembly and the fuselage sides, and if I assembled this kit again, I would detail the cockpit and add missing markings wherever possible.

This is a fine model of a popular aircraft, and the kit stands up well when compared to other recent Italeri releases.

Dennis Moore



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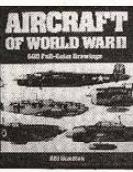
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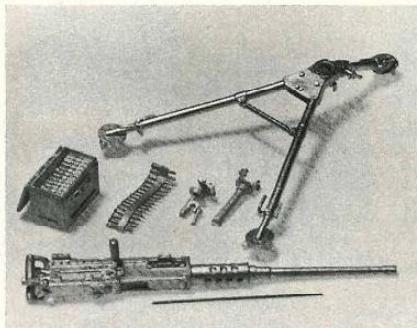
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FINESCALE MODELER staff photos  
by A. L. Schmidt



### Polyester filler paste

Ad-Tech Ultra-Filler No. 14 is a two-part filler putty (one pint of filler and one ounce of cream hardener) that sets in 5 to 8 minutes and that can be applied in thick or thin layers to almost any rigid surface (test on a scrap before using on styrene). The cans are dated with the month and year of manufacture; Ad-Tech claims a shelf life of one year if the material is stored in a cool place. The one-pint package is available from Mail-Call Models, 1525 West MacArthur Boulevard, No. 20, Costa Mesa, CA 92626, for \$7.95.



### Brass investment castings

Cal-Scale, P. O. Box 475, Pinedale, CA 93650, has released the first of its Combat Series line of 1/32 scale brass castings. The items are:

- CS-10, Browning .50 caliber M2HB heavy barrel air-cooled machine gun, \$4.95.
- CS-11, Browning .30 caliber M1919A4 air-cooled machine gun, \$3.95.
- CS-12, Browning .30 caliber M1917A1 water-cooled machine gun, \$3.95.
- CS-13, M31 pedestal mount, \$6.95.
- CS-14, M24 pedestal mount, \$2.75.
- CS-15, M3 ring mount, \$6.95.
- CS-16, pioneer tool rack, \$3.95.
- CS-17, cradle, pintle, and ammo box, \$4.95.



- CS-18, M2 .50 caliber ammo box with ammo belt, \$2.95.

Also available are kit No. 100, a .50 caliber M2HB air-cooled machine gun with tripod and ammo box, \$14.75; and kit No. 102, a .30 caliber M1917A1 water-cooled machine gun with tripod, cradle, and ammo box, \$16.95.

The items can be assembled with cyanoacrylate cement.

Cal-Scale chose 1/32 scale so that the guns and other accessories can be used on both 1/32 and 1/35 models. Although the parts are a little oversize for exact 1/35, the manufacturer claims that larger than exact-scale accessories provide better visual balance.



### Epoxy filler paste

Biggs Company, 612 East Franklin, El Segundo, CA 90245, manufactures an epoxy paste which sets in 10 to 15 minutes after equal parts of resin and hardener are mixed. The paste spreads easily and can fill even hairline cracks. The material's special virtue is that it is thicker than ordinary epoxy glues (so does not run), but not as thick as epoxy putties. It is sold in packages that contain one each 2½-ounce tubes of resin and hardener. The paste is sold in many retail plumbing supply stores or may be ordered from Biggs for \$4.00 per package.



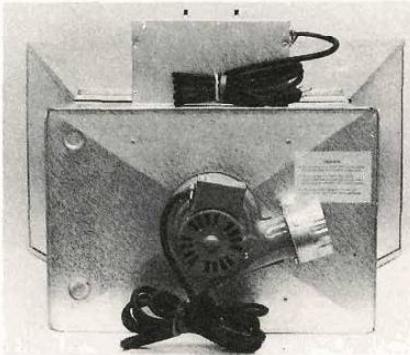
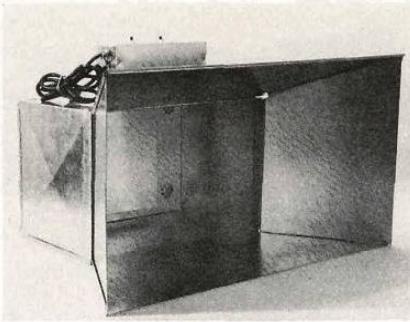
### Enamel paints

Precision Paints Company Ltd., P. O. Box 43, Cheltenham, Gloucestershire, GL51 5HR, England, has introduced a line of hobby enamels for pre-WWII British aircraft, WWII RAF aircraft and Royal Army equipment, Luftwaffe aircraft and German Army equipment, U. S. Army Air Force and U. S. Navy aircraft and U. S. Army equipment, and a line of colors for contemporary RAF, NATO, U. S., Israeli, and Swedish aircraft. There are currently 174 colors available and all colors are claimed to match applicable national standards (for example, the U. S. colors are based on Federal Standard 595a) and the standard numbers are printed on the cans.

The colors range from flat to dull (flat-flat) to gloss, as appropriate, although the gloss paints are only about 80 percent as glossy as the original standard. Precision claims that the lower gloss is used to obtain the proper scale effect on small models. All colors come in ½-fluid ounce (15 ml) cans, priced at £ 0.28.

If you want a color that is not yet in the line or a color mixed to match your sample, the firm states it may be able to custom blend the paint for you.

Precision has not yet announced a U. S. distributor for these paints, nor U. S. prices, so modelers should write directly to Precision for a list of colors and other information.



### **Painting booth**

Mitchell Products, Inc., 421 North Lake Street, Highway 45, Mundelein, IL 60060, has released the Hobby Vent painting booth and a line of Hobby Vent accessories. The basic booth is made of 26-gauge galvanized steel and measures 12" high by 17½" wide by 12" deep. It comes with a Dayton 120-VAC motor and fan with 95-CFM capacity, and a 10½" Rubbermaid turntable. The price is \$125.00.

Accessories include a 2-stage lighting set for illumination and heat treating (No. 107, \$46.50), an expansion kit that approximately doubles the size of the booth (No. 102, \$18.50), an expansion kit cover (No. 102-5, \$7.25) that fits over the front of the expansion kit enabling the booth to be used as a dust-free drying chamber, a 125-degree thermostat (No. 107-6, \$12.25) for use with the lighting/heating set, a 140-degree thermostat (No. 107-8, \$12.25), and a set of metal vent pipes and couplers (No. 111, \$17.50). An automatic timer (No. 125, \$24.25) is also available. The unit shown consists of the basic unit, the expansion kit, and a lighting set.

An instruction sheet explains installation and maintenance.

### **Reinforced cutoff wheels**

Dremel, P. O. Box 518, Racine, WI 53406, has introduced the No. 426 cutoff wheel for use with Dremel mandrel No. 402 and any high-speed motor tool or flexible shaft. The wheels are 1¼" in diameter and about ½" thick; they consist of an abrasive material bonded with resin and reinforced by fiberglass. The retail price per pack of four wheels is \$4.95.

The wheel cuts tempered steel, music



wire, brass tubing, aluminum sheet, pine, and styrene; a test wheel showed little wear after more than an hour's constant use. The new wheels perform at least as well as the Dremel No. 409 emery cutting wheel and are safer because they are far less likely to fly apart.



### **1/48 and 1/72 streamlined strut stock**

Pegasus Model Products, Inc., 10221 Slater Avenue, Suite 118, Fountain Valley, CA 92708, offers packages of 2½" lengths of streamlined styrene molded plastic strut material suitable for 1/48 and 1/72 model aircraft. A package contains two frames, each with four sizes of struts. The struts are approximately one-third as thick as they are wide. Each package costs \$1.98.

### **Landscaping materials**

Life-Like Products, Inc., Baltimore, MD 21211, has introduced its line of SceneMaster ground foam, lichen, and rock landscaping materials for dioramas. There are seven kinds of ground foam for simulating bare earth and grass and other vegetation; these range

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in size from very fine texture (less than 0.01") to fairly coarse (approximately 0.1") and in color from light gray to dark green. The lichen is dyed green and may be used to model shrubs and trees. There are also light gray and dark rocks with a grain size about 0.03", and a black rock to simulate coal. The ground foam and lichen are packaged in 18-cubic-inch plastic bags, the rocks in 14-ounce bags. All are priced at \$1.25 per bag.



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### Plastic rod

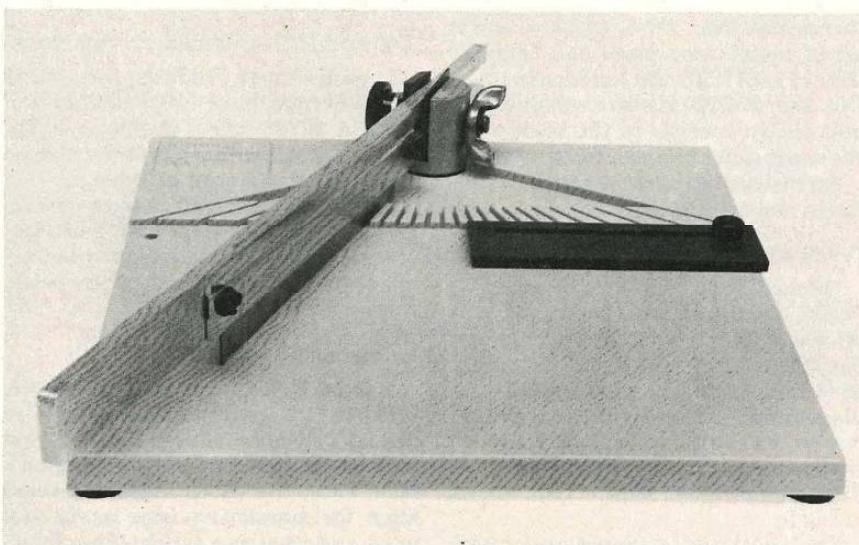
Grandt Line, 1040 B Shary Court, Concord, CA 94518, offers styrene rod from Slater's of England in packages of 12 one-foot lengths. Diameters available are 0.010", 0.020", 0.030", 0.040", and 0.050". Each package costs \$2.50.

### Modeling miter

Kalee, Inc., 2041 Winnetka Avenue, North Minneapolis, MN 55427, offers a Lexan modeling miter that features a  $7\frac{1}{2}'' \times 7\frac{1}{2}''$  cutting surface. The tool can cut any angle up to 60 degrees in 5-degree increments, plus  $22\frac{1}{2}$  degrees. It uses ordinary single-edge razor blades or Zona razor saw blades, and has a slide stop for use when cutting many pieces of the same length. The miter cuts wood, plastic, and brass and aluminum tubing. The price is \$21.95.

### Epoxy putty

Woodhill Permatex division of Loc-tite Corporation, Cleveland, OH 44128, has introduced Duro Hobby Strip epoxy adhesive and filler. This is a ribbon containing equal parts of white and green resins, which are kneaded for a few seconds until the material turns a uniform gray. The kneaded filler has the consistency of modeling clay and can be used to build figures, fill gaps, or bond wood, metal, plastic, and most other materials. Duro claims a ten-minute cure time for this epoxy; the material can be drilled, carved, sanded, and painted. A 0.7-ounce package is \$2.89.



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## From the editor

THIS MAGAZINE is the Charter Issue — Volume One, Number One — of FINESCALE MODELER, and I'm very happy to report that we're sending it your way far sooner than anyone had anticipated. Your enthusiastic response to our Spring 1982 test issue, published last January, convinced us that there is a definite need for a new magazine on the modeling scene. In mid-March we announced that FSM would be launched as a quarterly publication, and I sincerely hope that we'll be able to increase the frequency to bimonthly, perhaps even monthly, before long.

Starting any kind of new project is exciting, but starting this one is doubly so, because with it we hope to introduce a whole new standard of quality in a modeling magazine. The kinds of articles and columns we've planned are intended to open up the broad field of scale modeling, to show you what others are doing — and, more important, how they are doing it — and to spark your own imagination and creativity.

Each issue of FSM will bring you a full helping of fine modelwork and interesting, readable articles, but more than that, each issue will bring you detailed information on techniques you can put to work in your own modeling projects. In fact, we plan to make FSM into a new kind of tool, a tool that you can use to keep abreast of modeling trends and the dozens of new products being introduced in an ever-changing marketplace.

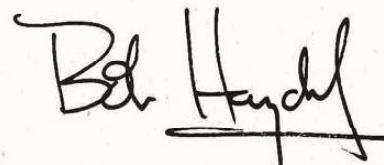
An emphasis on new product reporting is a large part of the difference between our Spring test issue and the magazine you now hold in your hands. You'll find — if you haven't already found them — four columns devoted to what's new: FSM Update (page 4), FSM

Workbench Reviews (page 10), FSM Looks at New Products (page 16), and FSM Book Briefs (page 60).

Each column takes a slightly different approach: Update lists new kit releases, new tools, and other product announcements, Workbench Reviews reports in depth on a modeler's experience in assembling or using a new item, FSM Looks at New Products covers those things that are best described with a photograph, and Book Briefs lists new offerings in reference materials. I hope you'll enjoy all of them.

We plan to introduce more new columns in subsequent issues of FSM, and I'd like to hear what you'd like to see in them, as well as what kind of feature articles you want. I appreciate your feedback, and as I promised last time, I'll read and answer every letter. Let me hear from you.

There simply isn't room here to tell you about all the fine feature articles we have planned for coming issues of FSM, but I'd like to ask for your help with one of them. Early next year we plan a staff review of all the various materials that modelers use as fillers, entitled "The Search for the Perfect Filler Putty." I want that review to be as complete as possible, so please send me a postcard with the brand name of your favorite filler and the address of its manufacturer. If you use a home-brewed filler, how about sharing your recipe with the rest of us?

  
Editor

## NEXT ISSUE

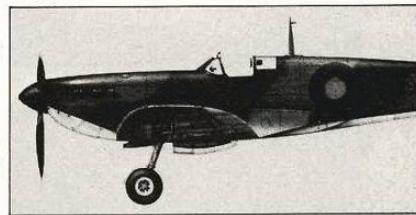
### FEATURES



Steve Zaloga's 1/35 scale Russian T-60 scout tank.

Armor expert Steve Zaloga returns in the Winter issue with a scratchbuilding project for beginners. The subject is a diminutive Russian T-60 scout tank in 1/35 scale, and Steve's article includes superb scale drawings and full-size templates. Prizewinning modeler Dennis Moore also returns, this time with techniques for building clear acrylic display cases for any model. And, even if you have never built a diorama, you will be able to follow FSM's step-by-step instructions on basic diorama techniques to come up with a magnificent display!

### DATA/DRAWINGS



Spitfire Mk. 1A renderings by Ken Sommerfield.

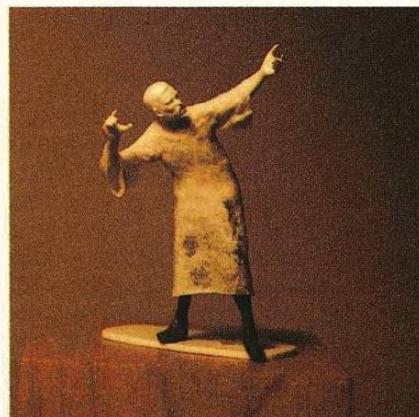
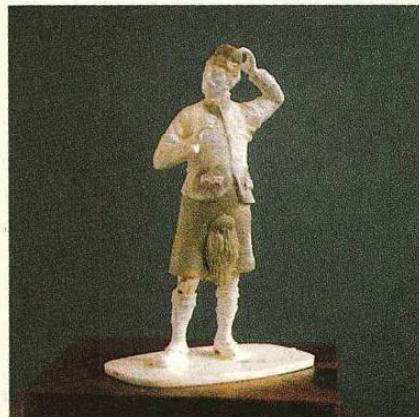
Modeler Ken Sommerfield spent more than a year researching the story behind the Spitfire Mk. 1A that resides in Chicago's Museum of Science and Industry. The result is a striking set of full-color renderings, and enough data for you to model the Supermarine Spitfire Mk. 1A in any scale!

**ALL IN  
WINTER  
FSM!**



This photo by Lane Stewart; all others by the author.

**"It is most complimentary, sir!"** The scene is Cairo in 1882, and the subject is salesmanship: A kilted Highlander of the legendary Black Watch tries on a fez while a robed Egyptian furnishes the hard sell.



Both figures are extensive conversions, but the techniques used to make their garments differ. (Middle) The Highlander's kilt, pouch, and the all-important fez were formed from epoxy putty, while the Egyptian's simple robe-like gallabiya (above) was made from glue-soaked facial tissue.

# Posing and painting "The Fez Seller"

A dramatic two-figure vignette built from Airfix 1/32 scale multi-pose figures

BY JOE BERTON

**I**N 1882, using the excuse of safeguarding the Suez Canal, the British occupied Egypt. Their occupation lasted, in one form or another, for over seventy years, and in addition to reorganizing the government, during that period the British Army interacted and interfered with the Egyptian society in many ways.

Such interplay between Western and Middle Eastern cultures is the subject of my two-figure vignette, "The Fez Seller." The scene is Cairo, the date perhaps October 1882, just one hundred years ago, soon after the Battle of Tel-el-Kebir where the Black Watch so distinguished themselves in annihilating the Egyptian Army. Somewhere among the brass and leather shops in the crowded, winding streets of Khan-el-Khalili a private of the Black Watch is checking his good looks by trying on a fez, the popular headgear of the Ottoman Empire. The Highlander has the fez pushed back on his head, daintily adjusting it, while a white-robed native (doubtless the nineteenth-century equivalent of a used-car salesman) hovers over him and assists with a small hand mirror.

Both figures are conversions based on Airfix multi-pose and Tamiya WWII figure parts. Some modelers may find it hard to envision just how the jaunty Highlander and the robed Egyptian *fella* were pieced together from parts of Afrika Korps, desert rats, and tank commander figures, but that's the way I did it. If you haven't tried a figure conversion, the Airfix sets are relatively inexpensive and a good way to learn.

**Sorting figure parts.** Each Airfix multi-pose set includes six soldiers with separate heads, arms, bodies, and legs. The parts are well sculpted, anatomically speaking, and (to me at least) lack the stiffness that typifies Historex figures. Over the years I've purchased several different sets and sorted all the heads into one box, right arms into an-

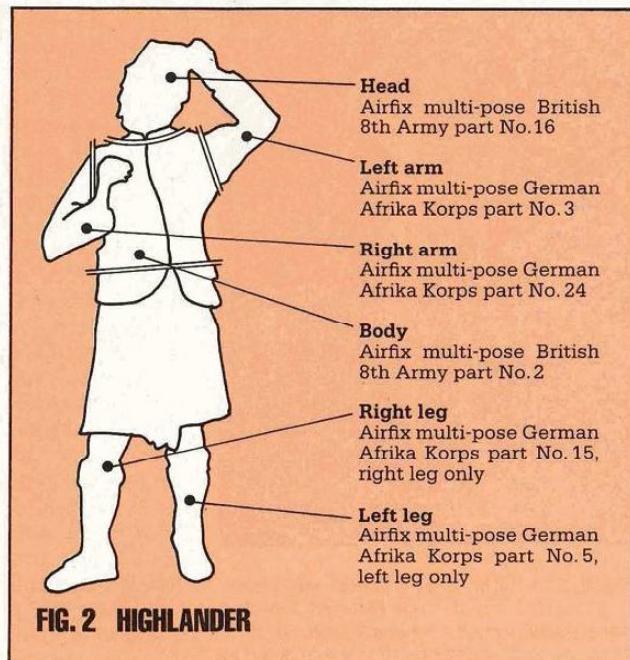
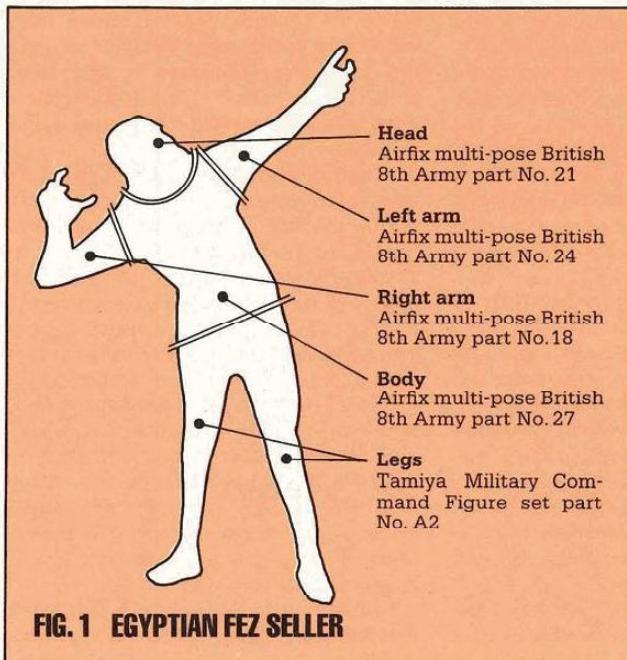
other, and so forth until I built up an impressive "morgue" of body parts that offers me almost unlimited conversion possibilities. Figures 1 and 2 show the parts used for "The Fez Seller."

I draw upon the sorted figure parts to assemble basic figure armatures, and given the wide variety of positions available in the Airfix sets little cutting and bending is required. I start by concentrating on the pose I want for each figure, then experiment. It's important to pay careful attention to anatomy and to evaluate the pose in terms of what does and doesn't look right, because if a figure looks strange and misproportioned as a naked armature, it will still look strange and misproportioned after it's dressed, primed, and painted.

Once I'm pleased with the pose of the basic figure armature, I assemble its parts, let the joints dry, and scrape off all the uniform details using a modeling knife and a motor tool. Next, I fill the major joints between parts with Testor's body putty. At this point the figure is basically a naked version of the finished piece, ready to be dressed, Fig. 3.

**Dressing the Highlander.** I clothed the Highlander figure with garments made from two materials: A + B epoxy putty and Testor's body putty. A + B putty is one of several two-part epoxy doughs used in the plumbing trade. It comes in the form of two foil-wrapped bars, and when equal portions of each bar are kneaded together the resulting putty has the consistency of modeling clay and will air-dry hard in a couple of hours. I apply the putty with a rounded sculpting tool (a dowel that has been tapered to a point in a pencil sharpener, then rounded and smoothed with sandpaper will do), and smooth it with water. Details can be sculpted in easily with the pointed tool or a modeling knife.

The kilt and sporran (the purse-like pouch) are epoxy putty. After building up the basic form of the kilt, Fig. 4, I added the pleats in the back, Fig. 5, by pushing the flat edge of my modeling knife blade into the soft putty at par-



allel and equal distances. This was an easy and effective way of dealing with what I had thought would be an unusually difficult bit of modeling. I then finished the kilt by trimming the bottom edge (hemming, I guess you could call it) with the knife.

The doublet and stockings were built up with Testor's body putty, Fig. 6. How you apply this putty is important. I squeeze small amounts onto an index card, then use a No. 2 brush moistened with Testor's liquid plastic cement to thin and apply it. Because the small brush and the plastic cement allow greater control over the consistency and workability of the putty, it's easy to fill

gaps and build up wrinkles and folds.

**"Liquid sprue."** The body putty requires about a day to dry thoroughly, then it can be trimmed and sanded. Next, I gave the figure a light coating of what I call "liquid sprue." I make this handy goop by dissolving bits of sprue in a bottle of liquid cement. It takes a while for the solvent to dissolve the plastic, but when the mixture has the consistency of Elmer's Glue-All I brush it lightly over the built-up putty parts to give them a thin, smooth plastic coating.

The Highlander's belting was made from white writing paper coated with Elmer's Glue-All. First I trim the paper

to the right width and brush it lightly with water to make it pliable. Then I place a dot of Elmer's on the figure at each end of the belt, lay the damp paper in place, and hold it there for a minute or two. Finally, I brush Elmer's over the entire belt to make it hold its shape.

By the way, in modeling belting (or anything else, for that matter) it's important that you understand what you are trying to make. To the uninitiated, the belts on a figure often look like a tangled mess of buckles and straps, but each one starts somewhere, goes somewhere, and has a purpose. Always study reference material until you have a





Fig. 6. The Highlander's jacket and stockings were formed from thinned Testor's body putty, applied with a brush. To seal them before painting, these parts were coated with a dissolved plastic solution that the author calls "liquid sprue."

clear understanding of just what it is that you're out to model, then go to it.

I completed the Highlander with a canteen and equipment pouches formed from epoxy putty, epaulets made from paper, and buttons cut salami-style from stretched sprue.

**Facial tissue for the fellah.** I posed the Egyptian, a *fellah*, or peasant, by literally assembling the parts around the Highlander, Figs. 7 and 8, so the figures would have the proper dramatic relationship to one another. The legs came from a Tamiya U. S. Command set; the rest of the parts are Airfix. After assembly the posed armature was scraped down until it was basically a nude figure. I built up the nose, beard,

*balgha* (heelless slippers), and *lebda* (headdress) using thinned body putty.

Other than his pose, the most important aspect of the *fellah* is his robe-like garment, a *gallabiya*, which is not a robe at all but a wide-sleeved, collarless shirt that falls to the ankles. I made this from Kleenex facial tissue and Elmer's Glue-All, employing a technique that has numerous applications in figure modeling.

First, I studied the figure carefully to see how the *gallabiya* should fit. I cut a piece of double-ply tissue to fit across the front of the figure, covering the area between the waist and the knees. This apron-like section was brushed lightly with Elmer's thinned with water, and the glue was also brushed onto the figure where the tissue was to go. After positioning the tissue on the figure I lightly brushed on more thinned glue to give it more body.

By directing my brush strokes I introduced a few folds and wrinkles into this first tissue "apron," but its main purpose was to serve as a base over which more folds were added using body putty after the tissue and glue had dried. After shaping the front section I turned the figure over and added a similar tissue piece across the backs of the legs.

A key principle in working with wet tissue is to avoid doing too large an area at once. It is easier to break a garment down into several small tissue sections than to wrestle with a piece large enough to cover an entire robed figure. Remember, too, that it's easier to add folds later using putty than it is to make them by working and tugging at the glue-soaked tissue.

After the overall shape of the drapery was formed I gave all the tissue areas of the figure several more coats of Elmer's to stiffen the tissue and help

fill in its texture. Next I added folds with body putty, some of them stretching from the shoulders to the hem. Once I was satisfied with the robe I gave it a thin coating of liquid sprue solution.

**Priming and painting.** Since there isn't room here to cover painting techniques in detail, I'll try to pass on a few important points. First, I consider it absolutely essential to eliminate all flaws, scratches, and gaps on converted figures before painting. A quick primer coat of white enamel invariably reveals such flaws so they can be corrected.

Next, I underpainted portions of each figure with a base coat of the actual colors to be used later — the skin area received a base coat of flesh, the cotton robe white, and so forth. On major areas such as the Egyptian's robe I blocked in shadow areas as part of this base painting step, too.

I finished the figures with Winsor & Newton oils, Plaka water-base paints, and Testor hobby enamels for the metal parts. Oils offer smoothness and ease of blending, and the Plaka colors were used for the patterned areas on the kilt and stockings because they dry quickly and correcting mistakes is easy.

I have two tips that pertain to these specific figures: First, the Black Watch kilts are very dark plaid — many modelers paint them far too bright. If you use Plaka and the kilt turns out too bright, simply give it a light wash of black Plaka to darken it. Second, painting a white garment like the *gallabiya* is easier and more convincing if you exercise great restraint in shadowing the white. It's far better to err on the light side than to use heavy grays and black.

**Modeling an oriental rug.** Since this vignette is set in the Middle East of the 1880s, nothing could be better than oriental rugs on the base. The first problem encountered in modeling rugs in miniature is capturing their texture. I rolled epoxy putty smoothly and thinly over the base, trimmed the edges, and while the putty was soft stretched a piece of T-shirt material over it and pressed in the texture.

I painted the rugs with Plaka colors, then ground artist's pastel chalk into fine powder and lightly brushed it over the rugs to add a warm and well-used look. The color photo on page 20 shows the result. I was careful to keep the rug pattern relatively simple so it wouldn't overpower the figures; they must always come first, and the base should only complement them.

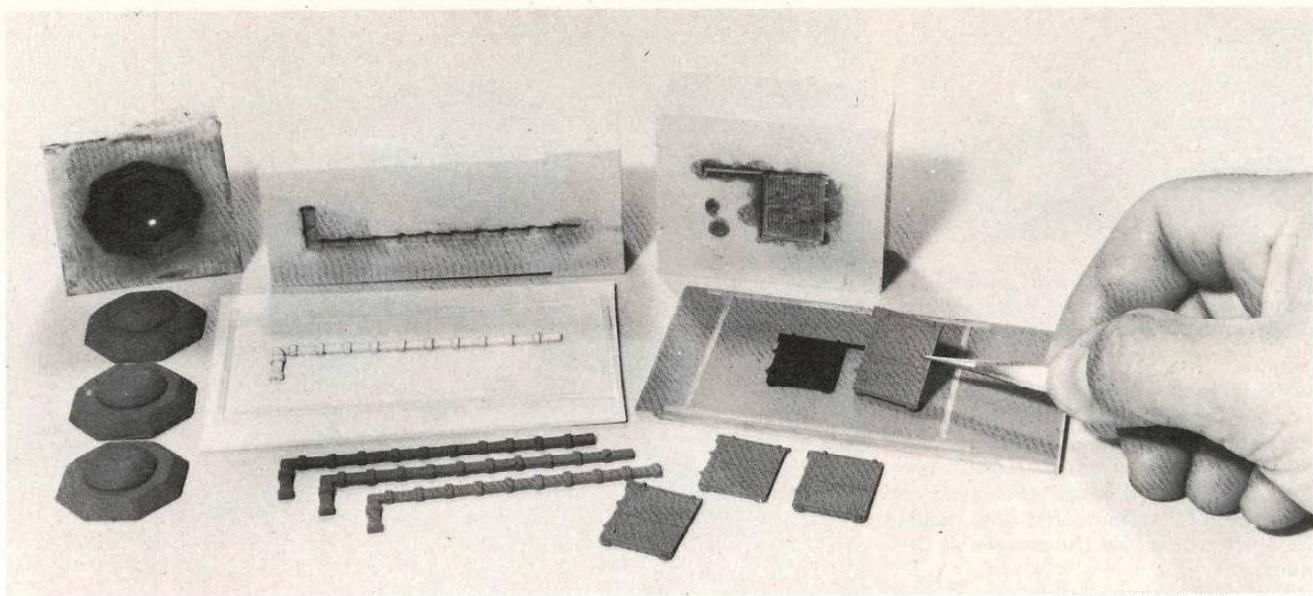
The last item I added was the Egyptian's small hand mirror. This was cut from a mirror-finish plastic sheet purchased at a dollhouse miniature shop.

That's it for "The Fez Seller." Did the *fellah* sell the fez to the Highlander? Hard to say, but perhaps you can answer the question by modeling your own version of this vignette.

FSM



Figs. 7 and 8. By far the most important element in the vignette is the relationship between the two figures. To ensure the interplay would be right, the Egyptian armature was posed after the Highlander figure was substantially complete.



FINESCALE MODELER: A. L. Schmidt

Styrene parts, from left: a 1/35 scale commander's cupola, a tile roof coping, and a boxcar door modified from a commercial part.

## Styrene parts from RTV molds

The only exotic tooling is a toaster oven

BY BOB HAYDEN

**A**LL OF US occasionally need several — or several dozen — identical parts for a particular model or diorama. Over the years I've tried all kinds of casting materials, but for the past couple of months I've been experimenting with clear styrene beads. While this material isn't the answer for every casting situation, it does offer significant advantages over other methods. To give credit where it's due, I got the basic idea from a one-page article by Terry Metcalfe in a model railroad specialty magazine, *The Narrow Gauge & Short Line Gazette*.

Making parts with this technique of-

fers several advantages over casting with two-part epoxy or polyester materials. First, the finished parts are styrene, so they can be joined with regular liquid cement and working with them is just like working with kit parts. Second, especially when the parts to be made are small, there's no need to mix tiny batches of resin and hardener, and little material is wasted. The styrene pellets are inexpensive and have an unlimited shelf life, and because the most sophisticated item of equipment required is an oven, this is a technique that anyone can use.

**Preparing the pattern.** As long as it's flat on one side the master pattern can be anything you like: scratchbuilt,

converted from existing parts, or a piece from a kit that's no longer available. It should be something that you can't easily mass-produce some other way, and it must not be undercut in such a way that it will be impossible to remove the finished part from the mold, Fig. 1. The one-sided requirement, by the way, is not as restrictive as you might think. Many parts only need detail on one side, and others can be made as flat halves and cemented back-to-back.

The pattern should be as perfect as you can make it, and in most cases it's worth making two or three patterns and choosing the best, since any defect in the master will be duplicated in ev-

### FIG. 1 GOOD AND BAD DRAFT ANGLES

The parts to be cast must have flat backs and should not have undercuts or hook-like projections. These cross-sections will cast completely and the parts will come out of the mold...

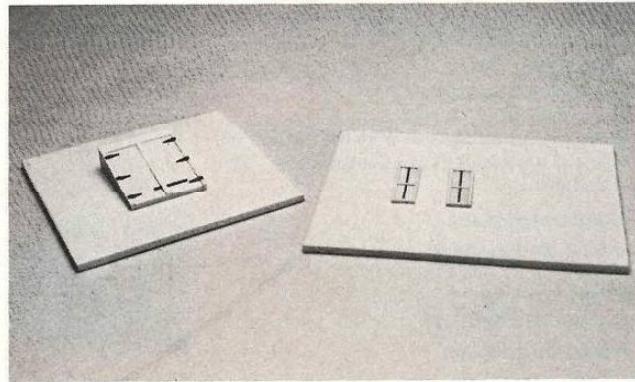
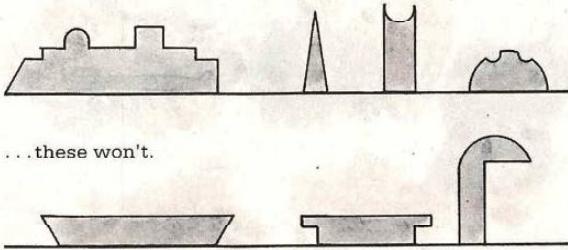
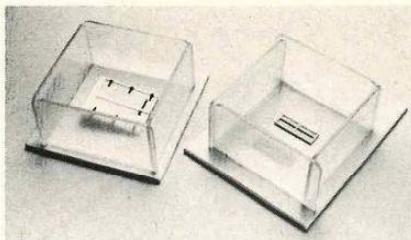


Fig. 2. Since the patterns must have a flat back anyway, the easiest way to build them is on slabs of heavy styrene sheet.

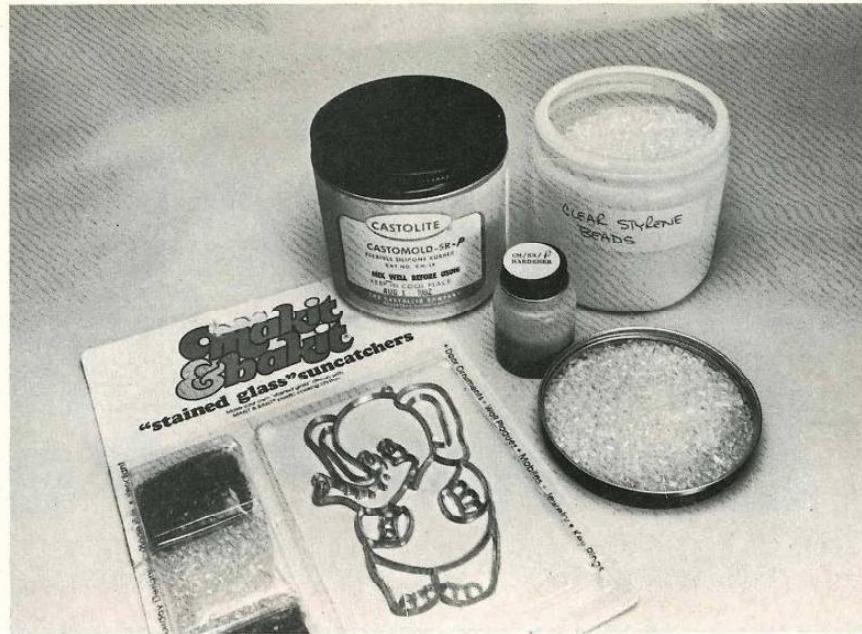


**Fig. 3.** The clear 1"-high cofferdams around these patterns are extra styrene dividers from plastic parts drawers.

ery casting. If a portion of your pattern is a kit part, be sure to fill sink holes and knockout-pin marks and remove all molding lines from it. If your pattern is hollow, fill or seal the cavity so that the RTV rubber can't seep inside it, which would lock the pattern in the mold.

Since the master must have a flat back anyway, I build mine on a rectangle of .060" styrene or 0.10" ABS, Fig. 2, then add 1"-high walls of the same material to make a mold box, Fig. 3. I make sure that the mold box clears the master by at least  $\frac{3}{8}$ " on all sides. Depending upon the shape of the pattern, the mold box could be made round (you could use a plastic cup, or even a tin can), which would minimize the amount of rubber required for the mold.

**Pouring the mold.** The molds are made from RTV (Room Temperature Vulcanizing) silicone rubber, an industrial material used for encapsulating electronic components, pouring gaskets, and, oddly enough, making molds, Fig. 4. There are several brands, including General Electric RTV-11, Dow-Corning Silastic 3110 RTV, and the product I used, Castomold SR/P. Most have simi-



**Fig. 4.** Materials for casting styrene parts: from left, a "Makit & Bakit" ornament kit; Castomold RTV rubber and hardener; and clear, untinted styrene baking crystals.

lar working properties. Shelf life for all these rubbers is about a year, so it's best to purchase the smallest quantity that will meet your immediate needs. The shelf life can be extended by storing the unused rubber in a refrigerator or freezer.

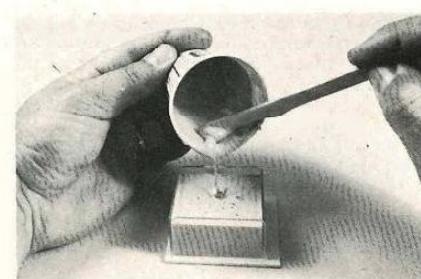
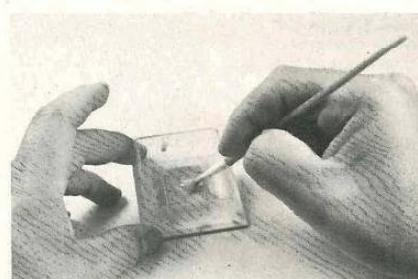
Unless part of the pattern is RTV, no release agent is required to keep the rubber from sticking to the pattern and mold box. To make a mold, mix the RTV in accordance with its instructions and allow the mixture to rest undisturbed for 20 minutes so most bubbles rise to the top and pop. Then, using an inexpensive disposable brush, work a thin coat of RTV over the pattern, Fig. 5. I like to force this initial rubber coat into the cracks and crevices of the pattern with a stream of compressed air from an airbrush. Then pour the rest of the RTV into the mold box and set it aside to cure for 24 hours, Fig. 6.

Don't try to skimp on the amount of rubber used to make the mold; it's best to fill the mold box to its full 1" depth. In fact, it's better to make the mold too

thick than too thin, since a thin mold may flex during casting and yield deformed parts, and a thicker mold will stand up to heat better than a thin one. If you didn't mix enough RTV to fill the mold box on the first pour mix up a second batch and pour it on top of the first; the two batches will bond as one.

Most RTVs take 24 hours to cure, and a good indication that the rubber has cured fully is that the exposed surface of the mold is no longer sticky. To remove the cured mold from the pattern, first strip the sides off the mold box, then carefully flex the mold and separate the master from the RTV. Inspect the mold cavity for defects and use a new single-edge razor blade to trim away the raised lip of rubber where the back of the mold met the walls of the mold box. This is so the upside down mold can sit perfectly flat during casting, Fig. 7.

**Casting with styrene beads.** The most readily available source of clear styrene beads in small quantities is a crafts store, where you can buy a refill package of the colored plastic cooking



**Figs. 5 and 6.** To ensure there will be no bubbles trapped in the face of the mold, first brush a thin coat of RTV over the pattern with a disposable brush (left), inspect for bubbles, then pour in the rest of the rubber to fill the mold box (right).

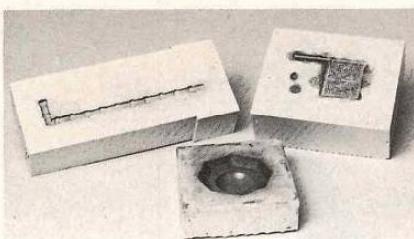


Fig. 7. These completed RTV molds were stained by attempts to cast parts from chopped-up sprue. The clear styrene baking crystals yielded better results.



Fig. 8. The cupola mold piled high with styrene beads prior to baking.

crystals supplied in "Makit & Bakit" suncatcher ornament kits. These colored beads are intended to be heaped into a cast-metal framework and baked for 15-25 minutes until the pellets melt, giving the finished ornament a transparent, stained-glass look.

How well the molten styrene flows into the mold depends upon the shape and depth of the mold cavity. Some molds will cast well if you simply heap beads over the cavity, Fig. 8, and place the mold in an oven preheated to 375 degrees F., the temperature called for in the "Makit & Bakit" instructions. As the styrene pellets reach their melting point, just above 230 degrees F., they become gel-like and slowly relax into the mold. After 15-25 minutes in the oven the mold can be removed, allowed to cool, and the finished part popped out.

The finished castings can be filed, sanded, drilled, and painted like any plastic kit part. Minor imperfections can be filled with your favorite putty. The plastic is just a little harder than that found in most kits, about the same

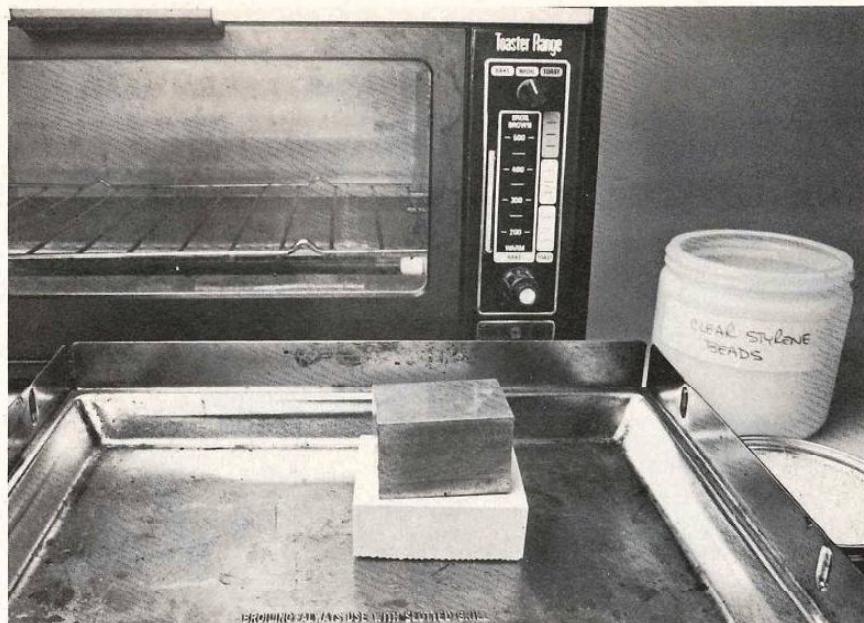


Fig. 9. A mold filled with plastic, topped with a preheated metal weight, and ready to go back into the toaster oven.

hardness as canopies and other clear parts.

**Kitchen-table injection molding.** If the beads will not make a perfect impression of all the detail of the pattern, the molten plastic can be forced into the mold cavity with a heated metal weight. It's the kitchen-table equivalent of injection molding, and it works like this:

1. Preheat the mold in the 375-degree oven for 15 minutes.

2. Heap styrene beads over the mold cavity and return the mold to the oven. At the same time, preheat a flat brass or steel weight large enough to cover the mold cavity.

3. After 10-15 minutes remove the mold from the oven and poke the gel-like plastic into any unfilled portions of the mold cavity with tweezers. Place the heated weight on top of the mold, squeezing the molten plastic into the mold cavities, Fig. 9, and return the mold with the weight on top to the oven.

4. Heat the mold, plastic, and weight for another 5-10 minutes, then remove and allow to cool. When the weight is cool enough to touch, pop away the mold and examine the finished part. Slip a thin knife blade under the part to separate it from the weight. If the parts stick to the weight, coat the metal lightly with a lubricant such as WD-40. It's possible to rapidly cool the heated mold and weight by running cold water over them, but I have warped several castings in doing so.

Whether you use the heated weight technique or not it's best to overfill the mold slightly, leaving some flash on the back of the casting that must be sanded off, Fig. 10. Castings that don't

come out perfect can be returned to the mold and reheated for another try.

**The variables.** Given a little experience in how a particular mold works, I found I could reduce its rejection rate almost to zero. The melting temperature of the plastic seems to be the most important variable.

The best temperature setting on my toaster oven is 410-435 degrees, but I suspect the temp inside is the recommended 375 F. Don't be tempted to increase the temperature more than 10 degrees at a time. I found that when the styrene beads are overheated they start to decompose, forming bubbles while hot and cooling to a brittle (and useless), candy-like mass. In case you're wondering, the RTV rubber I use withstands temperatures up to 600 degrees F., and most types have similar heat-resistant characteristics.

I don't know many modelers who don't have extensive sprue collections, so to answer your next question, no, sprue isn't a good substitute for clear styrene beads. While I have made one or two usable castings from chopped-up sprue, it tends to smoke in the oven, and the beads definitely work better.

One parting note — before you head off to the kitchen to Shanghai that toaster oven, remember that mold-making and casting are really justified only when you need many duplicates of a part that is not commercially available. It's far from a way to save money — the molding rubber is expensive, not to mention the amount of electricity you'll use — and the process is time-consuming. And, it's work — if nothing else, casting your own parts gives you a heightened appreciation of commercial products!

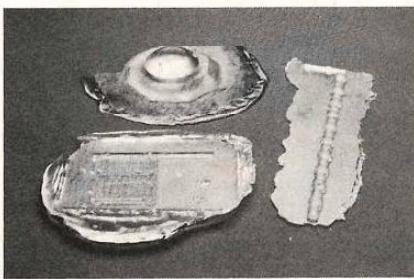
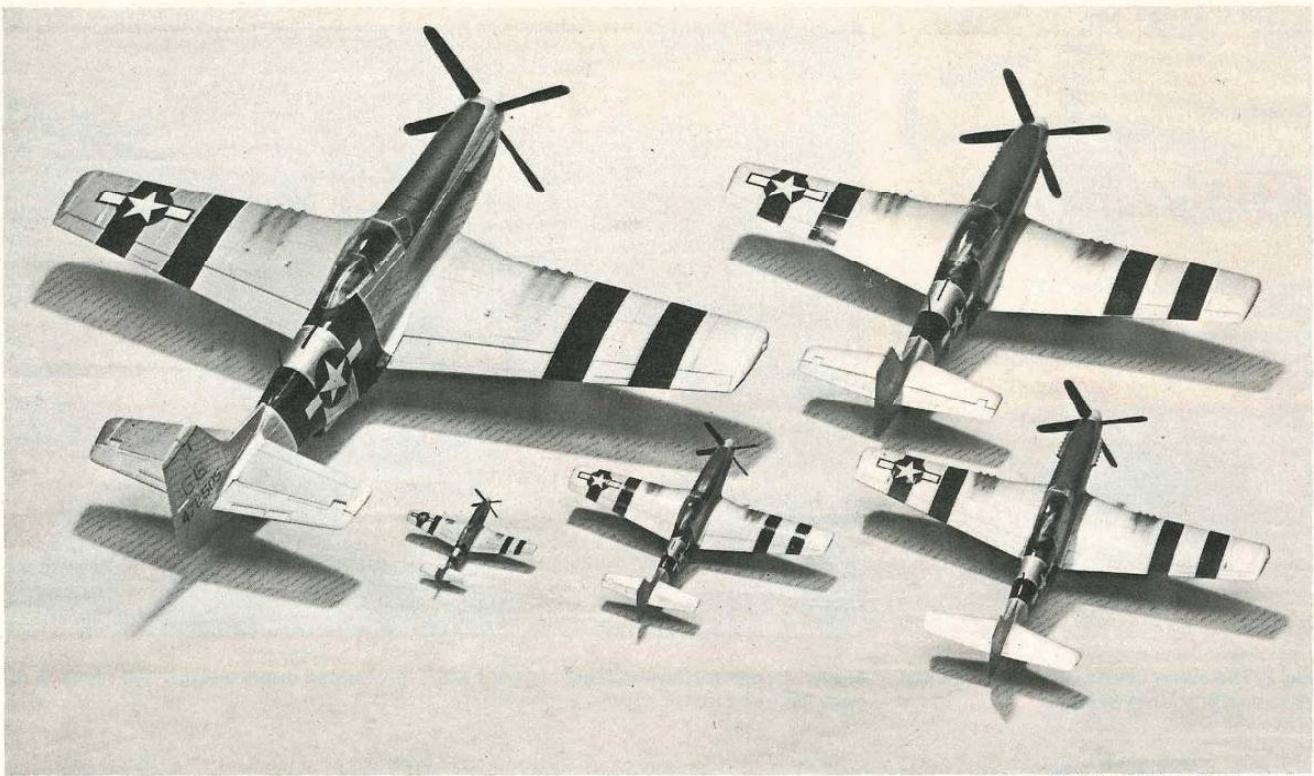


Fig. 10. These parts were made using the heated-weight injection technique. The flash will be removed by sanding.



All photos: FINESCALE MODELER, A. L. Schmidt

Models that will be handled frequently should be sturdy and easily repairable. These Mustangs have survived a number of

shows in shopping malls and public libraries without sustaining any damage.

## Building a five-model scale reference display

Quickly constructed P-51s that immediately explain the concept of scale

BY LARRY SCHRAMM

A COLLECTION OF MODELS for a public display should be attractive and informative: The models should first capture the viewer's attention and then answer a question. One question I often hear at modeling shows is "How do you know what scale that model is?" Another is, "What do you mean by 1/32 scale?" Instead of trying to explain this concept until we're blue in the face, several members of the Richard I. Bong Chapter, IPMS, Milwaukee, Wisconsin, decided that we would build a visual reference display, choosing one aircraft and building models of it in five different scales.

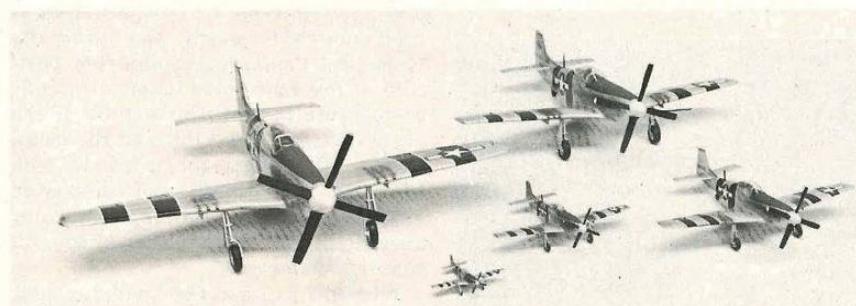
**The plane I modeled.** We looked about for a plane that would be at least somewhat familiar to most non-modelers (so that we wouldn't have to explain how big the full-size plane was), that had relatively few delicate parts, and that would be easily repairable. Plastic

kits would also have to be available in five scales. We decided on the P-51D Mustang, a plane that met all of our criteria, and that's attractive to boot.

Of course, there were many production versions of the Mustang, so which should we choose, and which pilot's plane should we represent? I decided on

Major William Shomo's "The Flying Undertaker" because Ralph Winkel, our late secretary-treasurer, was crew chief for that plane. The display is dedicated to Ralph.

William Shomo, then a Captain, was with the 71st Tactical Reconnaissance Group, 82nd Tactical Reconnaissance Squadron, Fifth Air Force. While on a recon mission to Luzon in the Philippines on January 11, 1945, Shomo and his wingman, Lt. Paul Lipscomb, flying F-6Ds, intercepted a formation of 12 Japanese Tony fighters escorting a Bet-



In order to keep the focus on the relative sizes of planes in different scales, each of the models has identical color schemes and markings.

ty bomber. Shomo destroyed six fighters and the Betty in 15 minutes; Lipscomb shot down three more fighters. Shomo received the Congressional Medal of Honor; Lipscomb received the Distinguished Flying Cross.

The plane flown by Shomo that day was "Snooks 5"; I modeled "Snooks 6," P-51D-20-NA, serial 44-72505, a plane Shomo received a few months after these victories and the one that bore the famous "Flying Undertaker" lettering. The aircraft was named "The Flying Undertaker" because Major Shomo had been a licensed embalmer before the war. An excellent article by Ralph Winkel and Rev. Del Miller in *IPMS Quarterly*, Vol. 13, No. 1 (1977) explains Shomo's planes and shows their markings. By the way, William Shomo survived the war, remained in the Air Force, and retired as a Lt. Colonel.

**Kits.** I built my five models from the following kits:

- 1/24 scale — MPC No. 2-3502
- 1/32 scale — Minicraft / Hasegawa No. 1086
- 1/48 scale — Otaki No. OTZ-13
- 1/72 scale — Minicraft / Hasegawa No. 1101
- 1/144 scale — Crown No. 1033

**Construction.** Because these models were to be used only as a scale reference display, I made no effort to superdetail them, so the entire project took only about 35 to 40 hours. (For contest models, I often spend 50 hours on the cockpit alone!) In order to reduce construction time, I eliminated all parts that couldn't be seen on the completed models, i.e., engine parts, hidden cockpit and gun bay details, and so on. I added them to my spare parts box.

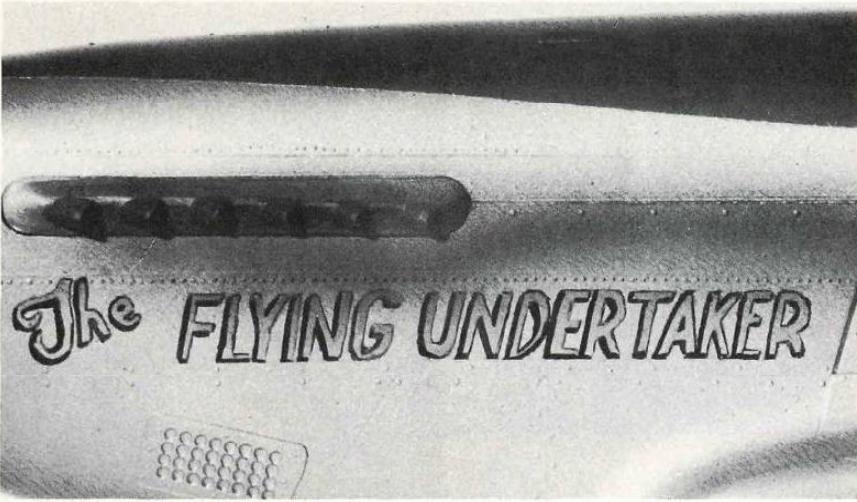
I did, however, fill all seams and painted and decaled the models carefully so that they would make a good impression on viewers.

I built the 1/24 scale kit separately because it had a large number of parts, but all of the other models were constructed simultaneously, using assembly-line techniques.

I first assembled and painted the cockpits and joined the fuselage halves. The wing assemblies came next, followed by the horizontal stabilizers. I left off all small parts until after painting and decaling.

**Painting.** I used Pactra paints on all of the models, and here again I used an assembly-line approach. I first painted flat black all of the tires, props, and the areas on the wings and fuselages where the identification stripes were to go. The anti-glare panels are olive drab, the prop hubs and tail tips are yellow. After all paint had dried overnight, I masked the fuselage and wing stripes, the anti-glare panels, tail tips, and canopy framing. I then sprayed all of the remaining surfaces with Pactra Chrome Silver.

Why did I paint in this sequence?



"The Flying Undertaker" markings are a great conversation starter. Hand painting the markings on clear decal paper (and on a flat surface) rather than directly on the model lets you correct mistakes more easily.

Well, if you've had any experience with metallic paints like silver, you know that if you apply the metallic paint first, you'll invariably pull off some of the paint when you remove the masking tape. Nonmetallic paints adhere better and can be masked safely.

If these were contest models, I would have used Liqu-a-plate to simulate aluminum, but knowing that these models would be handled often, I chose the Chrome Silver paint which can take much more abuse.

After the silver paint had dried, I removed all of the masking except that on the canopies and anti-glare panels and sprayed on several thin coats of Micro Gloss.

**Decals.** With the exception of the 1/48 scale model, I hand painted all personal markings for the aircraft on Scale-Master clear decal film. The 1/48 scale markings are from Microscale sheet No. 48-1, Mustang Aces, which includes the "Flying Undertaker" lettering. The yellow striping is from a Scale-Master sheet. Serial numbers are from Microscale sheet 72-25, U. S. ID Letters and Numbers. The stars and bars, kill markings, and all other markings came from

kit decal sheets or from my scrap box.

All decals were applied by the Microscale system. After the decals dried, I washed off all excess decal adhesive and setting solutions and gave the models several final coats of Micro Gloss. After this had dried, I removed the masking on the canopies and anti-glare panels and glued on wheels, gear doors, props, and antennas.

**Public reaction.** The display serves its purpose. We've taken it to several shows and the most common reaction from viewers is that, yes, it's a lot easier for them to understand scales when they have models to look at instead of just a bunch of numbers. For my own part, I found that building five models at once was great fun, and, in its own way, more relaxing than slaving for months over a single contest piece. Building the display was a welcome "vacation" from my more serious modeling projects, and I recommend such a vacation to all modelers. After all, there are enough kits available in enough scales these days that dozens of subjects exist for three-, four-, or five-model scale reference displays. Try your hand at one!

FSM



To save time, use commercial products if they are available; here the "66" is a commercial decal with hand painted shading.



Larry confined weathering to smoke marks behind the machine gun muzzles and exhaust stains near the engine exhaust ports. All external surfaces except the canopies are sealed with clear varnish to protect the color coats of paint.



# Modeling the Supermarine Walrus in 1/48 scale

Funny — it doesn't look like a Spitfire

BY ROSCOE CREED

IT'S HARD TO BELIEVE that the Supermarine Walrus and the Spitfire of World War II were designed by the same man, and only a few years apart. The Walrus biplane, with its maze of struts and wires, looks more at home alongside an S.E.5 of an earlier conflict than it does beside its sleek younger cousin.

**About the Walrus.** Reginald Joseph Mitchell probably wouldn't have designed the Walrus if he hadn't been asked to. In 1929 the Royal Australian Navy requested a short-hulled flying boat to be carried aboard ship for reconnaissance. Mitchell took the easy way out, but at the same time went the RAN one better: He refined his Seagull I design of 1922 and came up with an amphibian, the Seagull V.

Mitchell's anachronism had a 45' 10" wingspan and a 37' 7" hull that held a pilot, navigator, and "telegraphist air gunner." It stood almost half as tall as it was long: 15' 3" (on chassis). A nacelle mounted on struts between the wings carried a 775 hp Bristol Pegasus VI nine-cylinder radial air-cooled engine which swung a four-bladed wooden propeller, pusher style. To arrive at

four blades, the designer showed typical British practicality by bolting together two two-bladed propellers. The wings folded back alongside the fuselage for a folded width of a mere 17' 11". The main landing gear was fully retractable into the lower wing.

The Seagull V first flew in 1933 and its performance can best be described as sedate: Top speed at sea level was 124 mph and cruising speed at 3,500' was 95 mph.

The name Walrus was chosen by the Admiralty when the first order for the plane was placed for the Royal Navy in 1935. Aircrews soon applied their own names, however. "Steam Pigeon" was obviously derived from the effects of sea spray hitting the exposed cylinders of the Pegasus. Another, "Flying Gas Ring," came from the stove-like glow of the exhaust stacks at night. It was also called "Shagbat," for reasons known only to the British.

As to the manufacturer's name, I've found the plane called the Supermarine Walrus, the Vickers Walrus, the Supermarine/Vickers Walrus, and even the Vickers/Armstrong Walrus. This diversity results from mergers in the

British aircraft industry during the '20s, '30s, and '40s, so be prepared to look under all of the names when using bibliographies and indexes.

The Walrus was stressed for catapulting, although its rickety appearance gave rise to the feeling that one good shot would leave the top wing and engine behind on the deck. It was also fully aerobatic, but new pilots never looped it more than once because of the cold shower that splashed down out of the bilges.

Its hull could withstand landings and takeoffs in six-foot swells, a quality that meant the difference between life and death for many downed airmen and sailors bobbing about in the icy waters of the North Atlantic and English Channel during WWII.

The Walrus performed equally well in its shipboard scouting and air-sea rescue roles. Bristling with a Lewis gun in the fore and aft hatches, and toting a 100-pound bomb under each wing, it even saw antisubmarine service in the Mediterranean. But, overshadowed by the exploits of the fighters and bombers, the Walrus got about as much attention during the war as an



The author built his Walrus Mk. II from an Italian Artiplast re-release of an injection-molded kit whose English Merit molds date from the '50s. The kit is now manufactured by Smer Prague in Czechoslovakia.

ugly stepchild. Even its most heroic air-sea rescue efforts went largely unsung.

**The kit.** The Walrus kit was first released in England in the '50s under the Merit label. The one I was given was a '60s re-release by Artiplast of Italy. Lately the kit has resurfaced in Czechoslovakia under the name Smer Prague, with kits finding their way to the West through trades by individuals. The box clearly states 1/50 scale, but unless my facts are wrong or I misread my Murphy's Rule, the dimensions are on the money for 1/48.

In going through the pieces — 67 of them, now encumbered with considerable flash — I realized the kit, perhaps good enough for the '50s, is not so today. The simulated rivets depressed in the hull are a good scale inch in diameter, the sag of fabric across wing and tail surfaces is pronounced, and the interior is Spartan and mostly wrong. However, the general outlines are good. I found the kit a step ahead of scratch-building.

**The plane I modeled.** I modeled a Walrus Mk. II of 276 Squadron, an air-sea rescue unit operating in England early in the war, whose picture I found in the April 1968 *Aeroplane* magazine. Interior data came from a cutaway drawing on the endpapers of *The Supermarine Walrus*, a book by G. W. R. Nicholl published in London by G. T. Foulis & Co., Ltd., in 1966. These, plus a book titled *British Aviation Colours of World War II* and some IPMS articles from the past, put me in business.

**Detailing the hull and the interior.** I first sanded all of the hull joints on a piece of 400-grit sandpaper laid flat on the workbench, Fig. 1; this ensured little putty would be needed later. Then I sawed off the vertical stabilizer and the rudder; they are too thick and the fillet

is too large, so must be thinned down. The gaps in the fuselage halves caused by the surgery were filled with sheet styrene.

Opportunities for detailing the interior were rife because the kit provided only two bad seats, an incorrect instrument panel, and an overlarge steering wheel.

The inside of the hull features prominent reinforcing ribs which I made from strips of HO scale 2 × 2 model railroad basswood first smeared with white glue and then sanded to remove the rough edges, Fig. 2. The strips conformed easily to the curves of the hull and were cemented in place with Hot Stuff. I epoxied the hull windows in place and painted the interior a dull green.

Decking for the bilge covers came from styrene HO model railroad wooden boxcar siding, Fig. 3. I reshaped the seats to conform to those in the cutaway drawing and the pilot's seat got a wire landing gear raising handle and a masking tape seat belt with Waldron buckles. The pilot also got a scratch-built Waldron instrument panel, rudder pedals, throttle quadrant, and trim wheels.

The radio operator got a seat from the spare parts box (there was none in the kit) and radios complete with headphones. Unfortunately, this compartment was hidden when the hull halves were assembled.

I put the navigator and his table behind the pilot. A kit-supplied bulkhead between navigator and radio operator was tossed in the spare parts box; none shows in the cutaway.

A fluked anchor from a model boat and a scratchbuilt boathook went inside the fore hatch; a mounting ladder, sea anchor, flares, bilge pumps, and fuel transfer pumps went inside the aft hatch, Fig. 4. I sawed the magazines

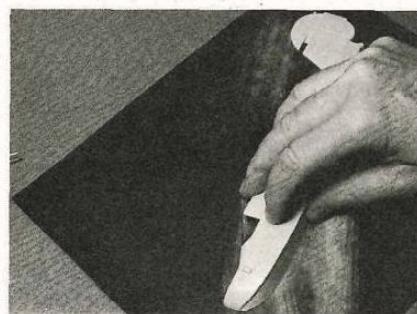


Fig. 1. Before assembly, Roscoe sanded all joints on a sheet of 400-grit sandpaper laid flat on the workbench. This ensured that little putty would be required.



Fig. 2. To simulate reinforcing ribs inside the hull, Roscoe coated strips of basswood HO scale 2 × 2 lumber with white glue, sanded them smooth, and then cemented the strips in place using freezer-cooled Hot Stuff applied with a draftsman's ruling pen.

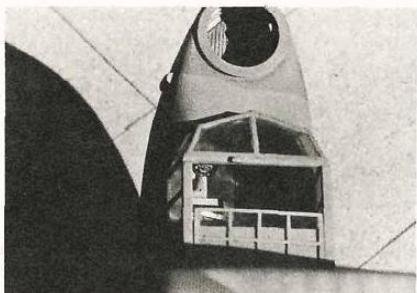
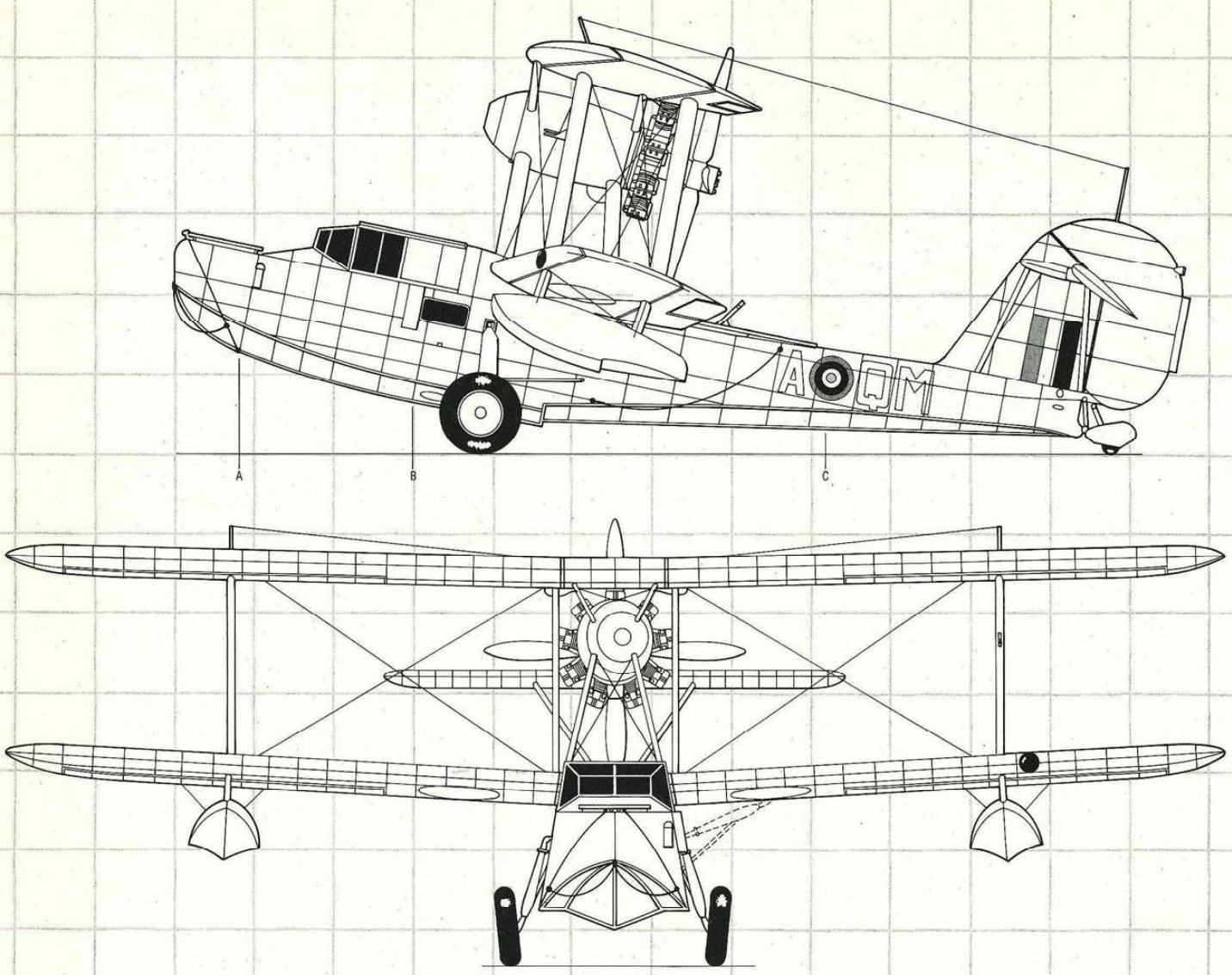


Fig. 3. A portion of the decking — HO boxcar siding — can be seen through the fore hatch, as well as the scratchbuilt control column through the cockpit hatch, which was sawed out and opened.



Fig. 4. View through aft hatch shows bilge pump and flares. Other interior equipment includes a sea anchor, boathook, fuel transfer pumps, ladder, and an anchor from a model boat.



Royal Air Force Museum

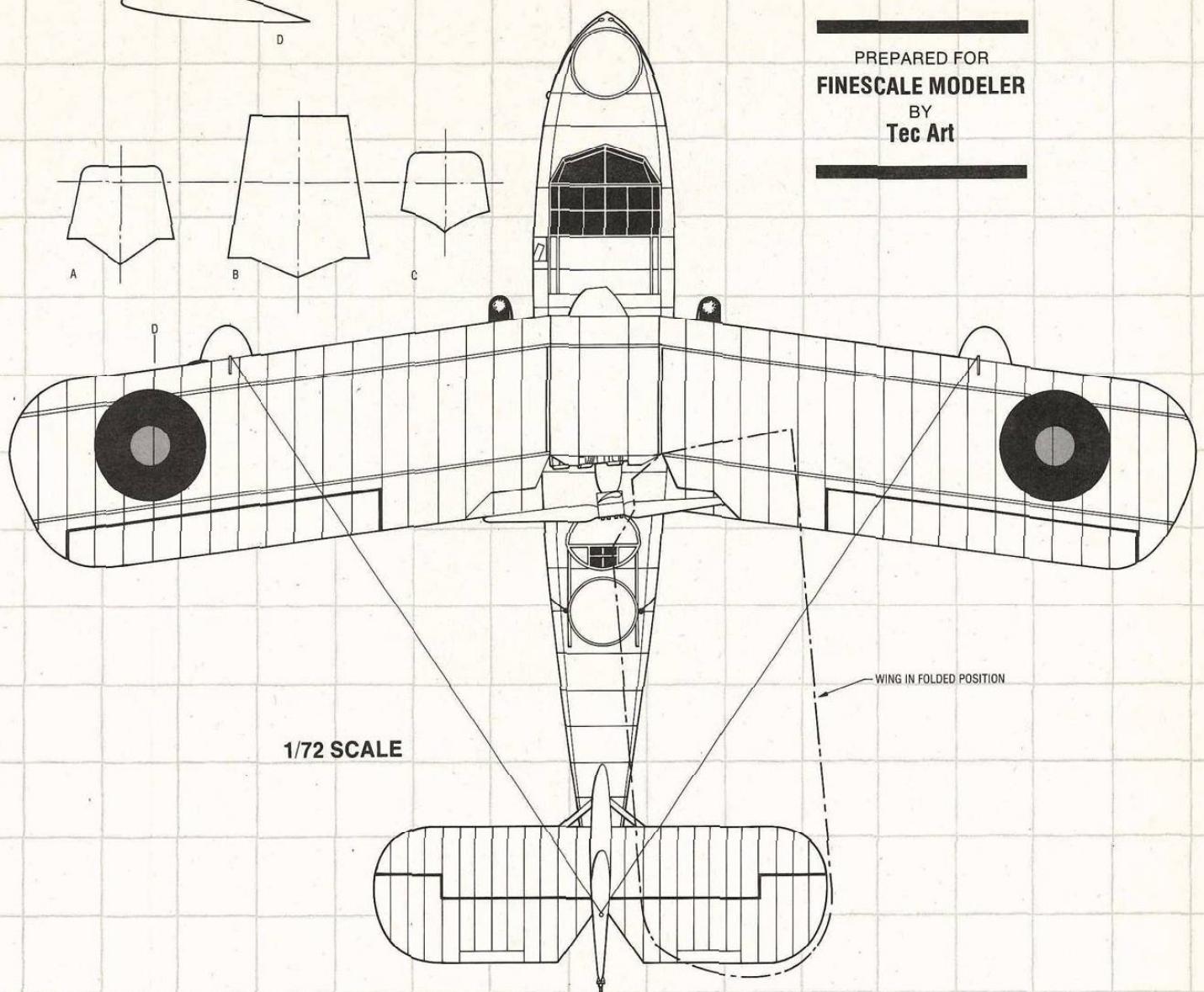
This 1938 photo of two mechanics working on a beached Walrus' Pegasus VI engine suggests interesting possibilities for a simple diorama.



Ron Moulton

This beautifully restored Walrus Mk. II is on permanent display at the Royal Air Force Museum, Hendon, London.

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Royal Air Force Museum

The Supermarine Walrus of the '30s and '40s was based on a 1922 design, which explains why it looked like a holdover from the previous war. During WWII it served mostly in air-sea rescue and scouting roles. There were two variants: the Walrus Mk. I differed from the Walrus Mk. II only in that the former had a metal hull, the latter a wooden hull. It was powered by an early model in the Bristol Pegasus series of radial engines.

#### SUPERMARINE WALRUS Mk. II

**Manufacturer:** Supermarine/Vickers  
**Power plant:** One 775 horsepower Bristol Pegasus VI nine-cylinder radial engine  
**Dimensions:** Wingspan - 45' 10" (17' 11" folded)  
                  Length - 37' 7"  
                  Height - 15' 3"  
                  Wing area - 610 square feet  
**Weights:** Empty - 4,900 pounds  
                  Loaded - 7,200 pounds  
**Performance:** Speed - 124 mph at sea level, 135 mph at 4,750 feet. Rate of climb - 12.5 minutes to 10,000 feet. Range - 600 miles at 95 mph at 3,500 feet. Service ceiling - 18,500 feet

from the Lewis guns and stowed the guns and ammunition inside the hull because none of my photos showed the guns mounted on their Scarff rings.

Thanks to their earlier sanding the fuselage halves needed very little putty after they were joined with liquid plas-

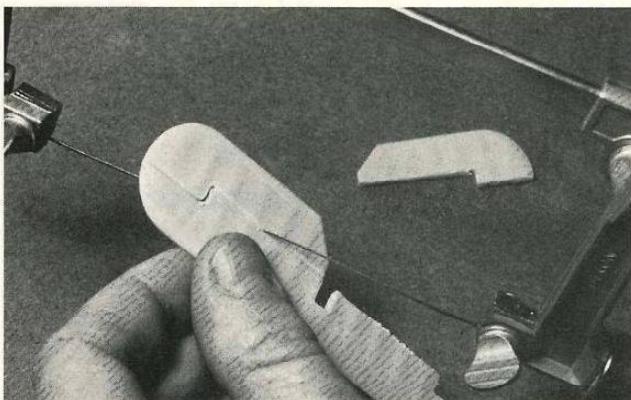


Fig. 5. After he had filed and sanded the assembly to an airfoil shape, Roscoe cut the elevators from the horizontal stabilizer with a jeweler's saw.



Fig. 6. Outboard wing struts were molded in pairs on a bar which fit poorly into a slot on the wing. These were sawed off, leaving part of the bar on the strut to serve as a mounting tab.

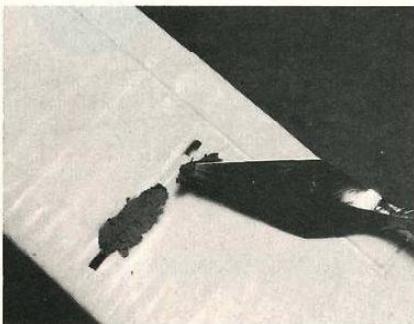


Fig. 7. The remaining portion of the strut bar was cemented in its slot, then puttied over and sanded flush.

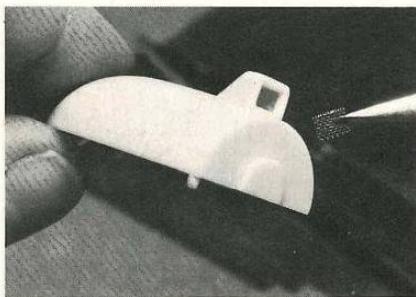


Fig. 8. After opening up the carburetor intake and before joining the nacelle halves, Roscoe inserted a piece of fine-mesh brass screen.

tic cement. I then masked all hatches and cockpit openings to keep out dust, overspray, and errant fingers, and gave the exterior of the hull and wing tip floats a coat of putty to fill the rivet depressions. (My photos didn't show rivets either.)

**Canopy.** The cockpit canopy fit poorly at the windshield so I white-glued it in place, then puttied and sanded the seam. First, however, I sawed out the sliding portion of the canopy top and filed the edges smooth. I later inset a flat piece of clear butyrate plastic in

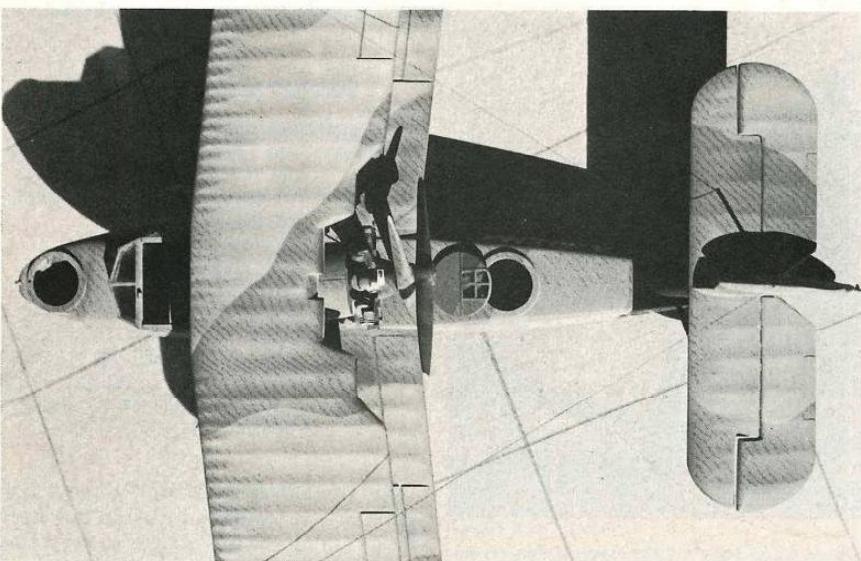


Fig. 9. Note the three-degree offset between the fuselage center line and the engine in this top view. Note also the rearward sweep of the wings, a concept seemingly ahead of its time for 1929.

the open position. Clear butyrate plastic sheet in thicknesses of 0.0075", 0.10", 0.015", and 0.030" is distributed by K&S Engineering and sold in most hobby shops. Butyrate is more flexible and more resistant to solvents than styrene.

I sanded all joints on the top and bottom halves of both wings, filed and sanded the too-thick trailing edges, then glued the lower wing to the hull.

**Elevators and struts.** Next, I filed the blunt trailing edges of the horizontal stabilizer to an airfoil shape and removed the elevators with a jeweler's saw, Fig. 5. I later remounted the elevators in their down position, as they appear in most photos.

The tail and wing struts are molded in pairs on bars which slip into slots on the bottoms of the top wing and horizontal stabilizer. The bars don't fit well. I solved the problem by cutting the struts from the bars, leaving the ends of the bars attached to each strut to serve as mounting tabs later, Fig. 6. I centered the rest of the bars in their slots and cemented them, leaving a hole at each end for the tabs. Each bar was puttied over and sanded flush, being careful to keep the tab holes open, Fig. 7.

**Nacelle, engine, and propeller.** Before cementing together the engine nacelle halves, I filed out the solid molded carburetor intake and installed a piece of Kemtron fine-mesh brass wire screen, Fig. 8.\*

Setting the engine nacelle in place was a trial and error proposition. Rather than offsetting the vertical stabilizer, the usual remedy, R. J. Mitchell had compensated for engine torque by offsetting the nacelle three degrees, Fig. 9. The kit designer chickened out and set the nacelle at zero degrees. I achieved the offset by cutting small pieces from one front and one rear nacelle strut on opposite sides, making it progressively

\*Kemtron products are sold by William K. Walther's, Inc., 5601 West Florist Avenue, Milwaukee, WI 53218, and you can order them through most hobby shops.



**Fig. 10.** The hubs of the kit-supplied propellers and Pegasus engine are good facsimiles of the original, but the propeller blades needed reshaping.

shorter than its mate, thereby causing the nacelle to twist.

This was a case of one solution creating its own problem. Since the top wing attaches to the nacelle by cabane struts, there was now a three-degree offset between top and bottom wings. I solved this by leaving off the cabane struts for the time being and aligning the top wing on the outboard struts. With the top wing taped in place, I then scratch-built new cabane struts to fit.

The kit includes a reasonable likeness of the Pegasus, but its propeller blades are too paddle-like, so I trimmed them with files and sandpaper, Fig. 10.

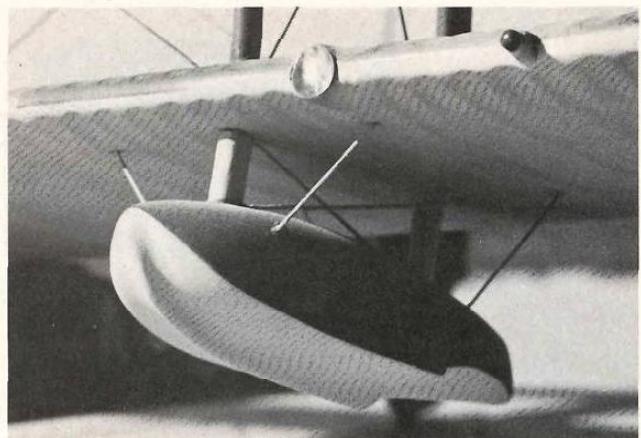
**Landing light and antenna masts.** Photos of the 276 Squadron Walrus showed a landing light on the lower port wing. The kit offered none, so I built up a putty fairing to house an M. V. Products O scale model railroad locomotive headlight lens, Fig. 11.\*\*

I discarded the spindly kit-supplied antenna masts, made new ones from large pins, and attached them to wings and rudder with Hot Stuff.

**Painting and decaling.** All components now completed, I began to paint the exterior. To date my Walrus in the Battle of Britain period, I chose Dark Sea Gray/Extra Dark Sea Gray over Sky Type S. The paint was Pactra, the grays mixed from an old chart, and the Sky Type S straight from the bottle. I limited weathering to lightening the upper colors with a few drops of white in the final coat, followed with a wash of white misted on to simulate streaks of salt spray.

Decals pirated from a Microscale Mosquito sheet (48-13) went on the top wing and vertical stabilizer. Fuselage roundels came from a friend's 1/72 scale spare decal box. Fuselage codes were from a Microscale sheet.

**Final assembly and rigging.** After all paints and decals had dried thor-



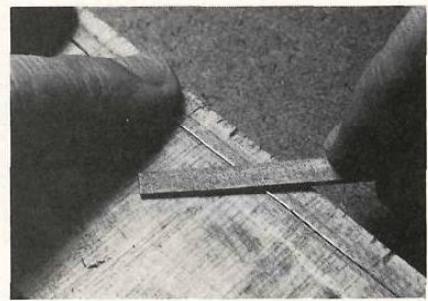
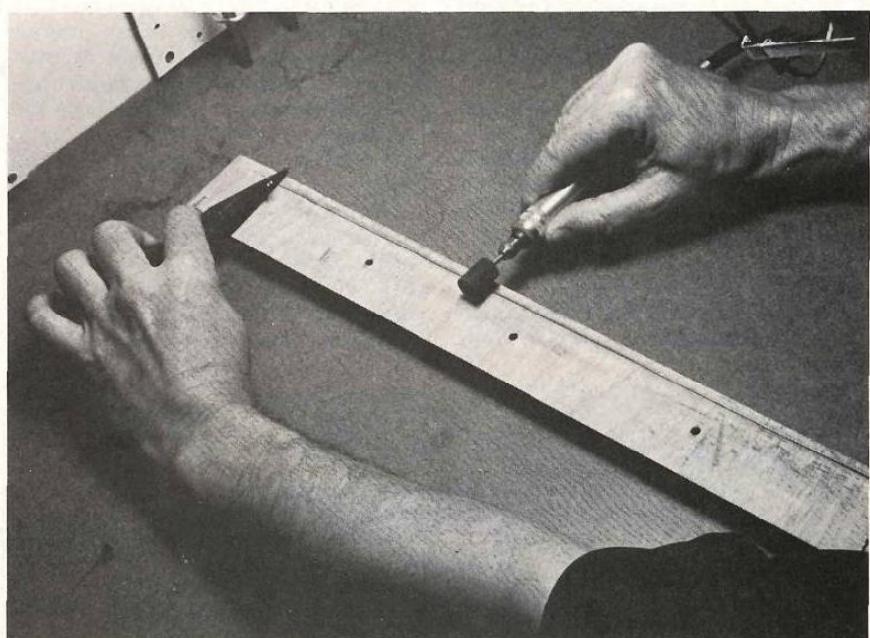
**Fig. 11.** His research photos showed a landing light on the Walrus being modeled, but none was supplied in his kit, so Roscoe built up a putty fairing to house an O scale model locomotive headlight lens.

oughly, I cemented the top wing in place.

I had planned how I would rig the model long in advance and had drilled holes in the fuselage, engine nacelle, and wings before they were assembled. I made flying wires from 0.015" music (or piano) wire, first ground flat with a

flexible-shaft motor tool, then finished with a file and sandpaper, Fig. 12. K&S Engineering distributes music wire in 36" lengths in 14 diameters from 0.015" through  $\frac{1}{4}$ ": It's sold in the flying model section of your hobby shop.

Unless you enjoy ruining expensive



**Fig. 12.** Roscoe made realistic flat flying wires from 0.015" piano wire held taut in a homemade rack on his workbench, first grinding with a flexible-shaft tool, then finishing with a flat file and 400-grit sandpaper.

\*\*M. V. Products, Box 6622, Orange, CA 92667.

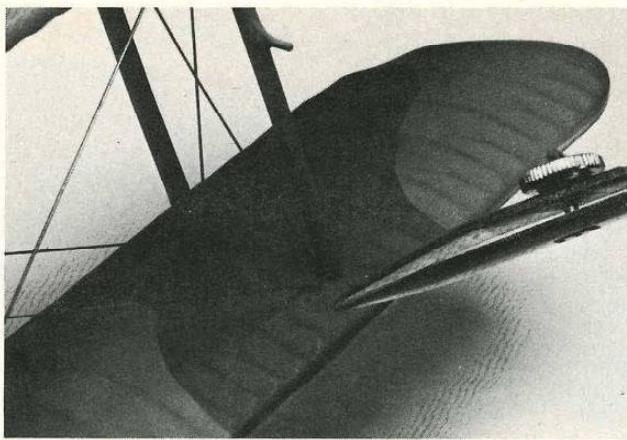


Fig. 13. Mounting holes for the flying wires were drilled early in assembly. The wires were cut to length and cemented in place with Hot Stuff after the model had been painted and decaled.

tools, never cut music wire with side-cutting pliers or any other tool except a file or a motor tool or flexible shaft with a cutoff wheel such as Dremel No. 409 or No. 426 (best). Clamp the wire in a vise before cutting and wear eye protection to prevent injury from sparks and broken cutoff wheels.

Although brass wire would be easier to work with, I've discovered the hard way that brass rigging looks great for a few months, but then begins to sag most discouragingly.

Short pieces of rigging are stiff enough to remain straight on their own; I cut these to length and Hot-Stuffed them in place. The longer pieces needed tensioning, so I first cemented one end with Hot Stuff. When this had set, I pulled the other end of the wire taut and applied Hot Stuff, Fig. 13.

Here's a tip: Keep Hot Stuff or any other cyanoacrylate cement in your

freezer and apply it with a draftsman's ruling pen. The extreme cold slows the setting time and the pen allows precise application. The pen points eventually become stuck together, but are easily separated and cleaned with a modeling knife.

An aft hatch cover is supplied in the kit as a clear part because it has four small windows in it. I masked the windows and painted the cover interior green, followed by a top coat of gray. No cover is supplied for the fore hatch, so I scratchbuilt one and laid it on the decking in its open position so as not to hide the stowed equipment inside the hatch.

The plastic axles of the main landing gear seemed inadequate to support the weight of the model, so I replaced them with wire. The landing gear struts, painted at the same time as the rest of the plane, were not mounted until al-

most the last, when I attached them with rubber cement. I then cemented the rudder and elevators in their new positions, added a monofilament thread antenna, and brushed dots of color on the running lights.

The tail wheel on a full-scale Walrus was unique: On a hard surface the struts telescoped to put it in a rolling position; at sea it dropped down so the fairing served as a crude but adequate rudder. The kit fairing is much too wide so I filed it to half its original thickness. Its mounts are quite delicate; it was the last part cemented to the model, Fig. 14.

A few touch-ups with Micro Flat to hide cement spots and scuffs, and my Walrus was finished. It stands in its case on my shelf now, my own small tribute to an obscure, homely little warbird that saved many more lives than it took.

FSM



Fig. 14. Close-up of the empennage shows the positions of elevators and rudder after remounting, a new antenna mast, and the tail wheel, the fairing of which served as a water rudder for maneuvering at sea.



Close attention to detail and fine craftsmanship enabled Roscoe to build a fine model from a below-average kit.

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# Three for the road

Detailing and weathering a trio of World War Two jeeps

BY BRUCE CULVER

THE CLASSIC "Truck,  $\frac{1}{4}$ -ton, 4 x 4 Command Reconnaissance" — the jeep — was built in huge numbers and saw duty with every service on every front in World War Two. Willys and Ford turned out nearly 640,000 of these rugged vehicles, and only the  $2\frac{1}{2}$ -ton 6 x 6 truck was made in larger quantities.

I built and weathered three 1/35 scale Willys MB jeep kits for this article; two using Tamiya kits and one from Testor/Italeri. Each kit has certain strengths and weaknesses, and either would make a fine model right from the box. Still, there are a number of simple improvements and details to add which result in more accurate replicas. Some of my

detail parts came from unused pieces or by "cross-kitting" — using parts from one kit to detail the other.

To illustrate some of the many possible variations in weathering, I finished each jeep differently. The Italeri kit (No. 821) portrays a reconnaissance jeep in France late in 1944, with basic dry weather effects, while the Tamiya jeep with the trailer (No. MM115) is modeled as a "Willie and Joe special" (my apologies to Bill Mauldin) in Italy, covered with mud and extra stowed gear. The third model, another Tamiya jeep built mostly because once I got started I couldn't stop, falls somewhere in between.

**Analysis and reference.** My first step in detailing or correcting any model is to analyze the kit and determine how far I want to go with changes. I try to

make the extent of planned modifications match the extent of my interest in the subject, so that I'll both enjoy the work and be comfortable with the results (and still be relatively sane when the project is over).

The second step is to obtain references — photos, sketches, and plans — to furnish information for making the changes I've planned. I find photo references the most helpful, but drawings are also good. References need be neither extensive nor expensive — magazines and soft-cover photo books often provide everything required, even for complex conversions.

Photographs of preserved vehicles — in museums, taken at enthusiast rallies, or in my case, photos of old jeeps still running on local streets — are an excellent source of modeling informa-

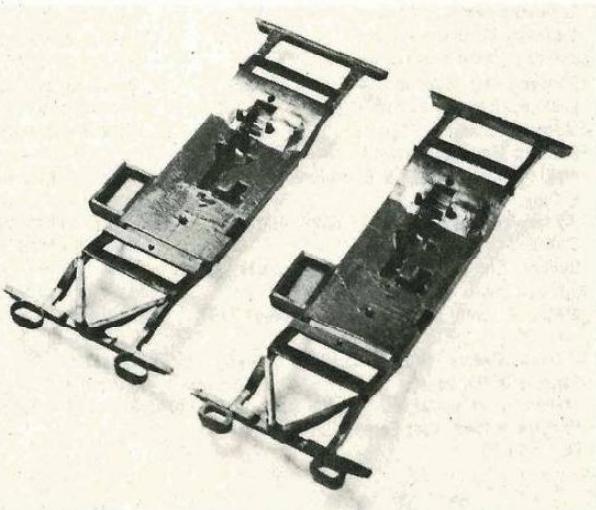
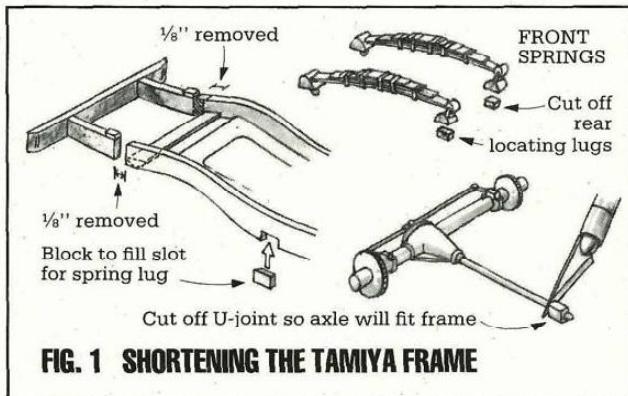


Fig. 2. The stock Tamiya chassis (right) compared to the modified version. The frame has been shortened, and the rear bumperettes modified as shown in Fig. 17.



Three photos, FINESCALE MODELER: A. L. Schmidt

Each of these 1/35 scale jeeps has a distinct personality of its own. The Tamiya model with the bullet holes (far left) was weathered to represent a light overall coating of dried mud. The Italeri jeep (middle) mounts a machine gun and a wire cutter bar. Its dry soil weathering was done with pastel chalks and sifted soil. The Tamiya jeep with the trailer wears a thick buildup of still-wet mud; author Culver calls it a "Willie and Joe special."

tion. Even modified vehicles often have original engines, suspensions, and other parts, and restored jeeps owned by collectors usually conform to original "as issued" condition.

**Corrections to the Tamiya kit.** This model represents a standard production jeep from mid-1942 up to the end of the war. There are one or two omissions and minor errors, but most are easy to fix. The most noticeable discrepancy is that the front wheels and bumper are too far forward. I remedied this by cutting off the frame at the front cross member, removing a  $\frac{1}{8}$ " section, and cementing the frame back together, Figs. 1 and 2.

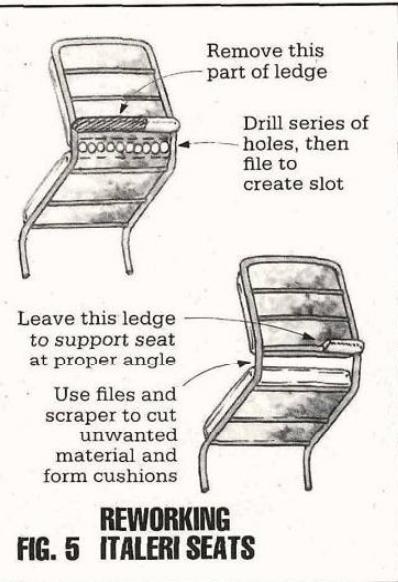
Next, I had to shorten the front drive shaft to fit the new frame length, and I modified the front spring assemblies by cutting off the rear mounting lugs and cementing these into their slots in the frame. I could then cement the front springs in place, using the front guide pins to locate them properly. This re-

stores the proper relationship between the radiator grille, wheels, and bumper, and is the one really important correction to make to the Tamiya model.

The wheels and tires on the Tamiya jeep lack tread detail, and my solution was to coat them with a heavy layer of mud (more about that later). Another approach would be to replace the wheels altogether (the wheels from the Italeri trailer will work, if you have spares).

**Improving jerry cans and seats.** The stowed jerry cans in the Tamiya kit are inaccurate, so I replaced them with better parts from U. S. accessory sets by Tamiya and Italeri. By the way, U. S. vehicles in northern Europe and Italy often carried German jerry cans, which were superior to the U. S. design. Also, the British manufactured an exact copy of the German can, many of which are still in use today, so you could substitute German cans instead of U. S.

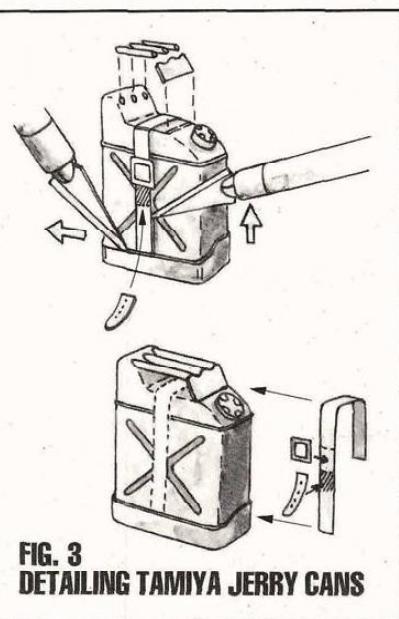
If you want to use the Tamiya jerry cans, Fig. 3 shows how to re-detail them. Cut off the single molded handle and replace it with a proper triple-bar grip, then replace the molded-on strap with a paper or thin sheet plastic one. You can also try carefully scribing along



**FIG. 5 ITALERI SEATS**

the sides of the molded-on strap to make it appear to be a separate part. Scribing a groove around the top edge of the bracket also helps make the can and bracket look like separate pieces.

The Tamiya jeep seats have been simplified by molding the seat cushions and lower frames onto the floor panel. To be correct, the right front seat should be supported above the floor on a tubular frame, leaving an open storage space under it. Since this area was commonly used to stow the canvas top, I made a folded top from tissue and used it and other stowed items to camouflage the solid seat support, Fig. 4. This is a good



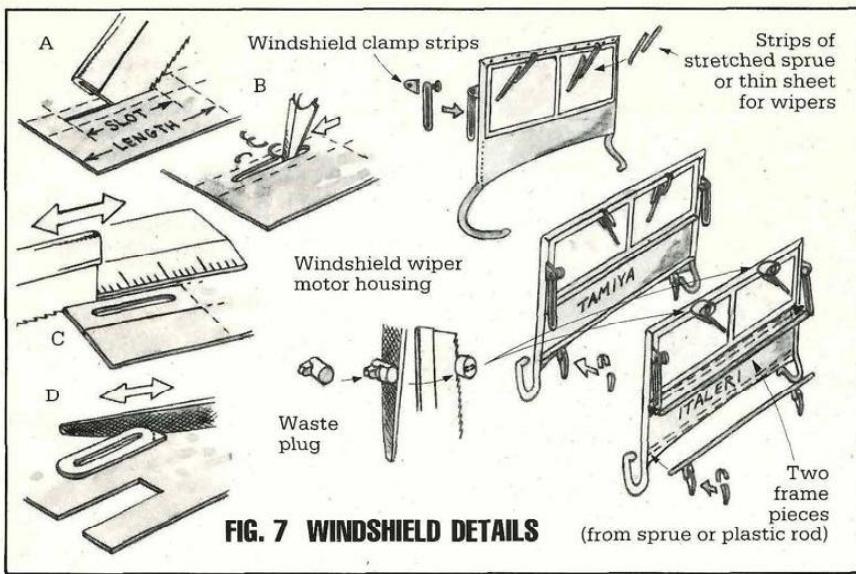
**FIG. 3 DETAILING TAMIYA JERRY CANS**



**FIG. 4 HIDING THE SOLID SEAT FRAMES**



**FIG. 6. OPENING UP THE GAP BETWEEN THE ITALERI SEAT CUSHION AND BACKREST TAKES TIME, BUT THE CHANGE IS NOTICEABLE, ESPECIALLY IF YOU DON'T PLAN TO HIDE THE SEAT WITH A FIGURE.**



**FIG. 7 WINDSHIELD DETAILS**

(from sprue or plastic rod)



U. S. Army

**Fig. 8.** This Willys jeep, seen during the fighting in the Cherbourg peninsula, carries the national (and Allied) star and circle on the canvas windshield cover. This was a common practice, since a lot of jeeps were driven with the windshields down and covered most of the time.

detail even for the Italeri jeep, which does have a correct separate front seat frame.

**Corrections to the Italeri kit.** The Italeri jeep represents a late-produc-

tion version with powered windshield wipers, some extra body fittings, and a torque booster spring for the left front wheel. Its detail is generally finer than that on the Tamiya model, even though the Tamiya kit has more optional parts and better figures. There are some minor discrepancies, most of which can be corrected easily.

The most important discrepancy is in the front seat design. Where the real thing had an open tubular frame and an open space between the rear of the seat cushion and the bottom of the backrest cushion, the Italeri seats are molded with the cushions touching to form a solid seat, probably to prevent the thin side frames from breaking. The gap should be about  $\frac{3}{32}$ " wide.

The best way to cut away the seat cushions and open up the required gap is with a steel cutter in a motor tool, but it's also possible to do the job by fil-

ing and scraping. If you don't have a motor tool, start by drilling a series of overlapping holes to remove most of the material, Fig. 5. Files, a modeling knife (for scraping), and sandpaper will complete the job, Fig. 6. The side frames are very weak; handle the seats carefully after separating the cushions. The solid bottom ledges can also be removed by filing, as WWII jeep seats did not have them. Leave about  $\frac{1}{4}$ " of ledge on the right side of the right seat to support it.

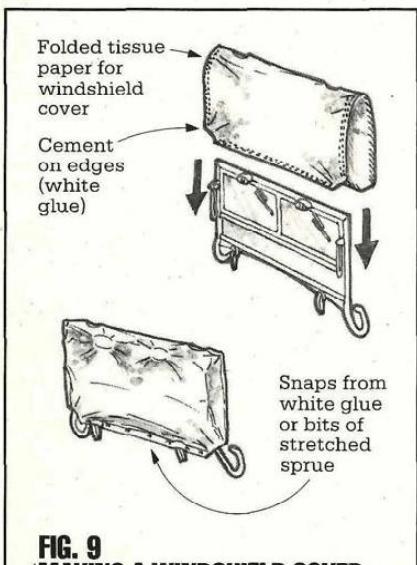
The other detail error in the Italeri kit is in the windshield frame assembly. On the real thing this was a steel tubing frame with a sheet metal panel welded to the front, below the glass. The tubing was visible on the back of the panel, but Italeri molded it flat, with only a fine outline for positioning the optional rifle scabbard. I added the framework using stretched sprue (nylon brush bristles would also work), Fig. 7. I elected not to install the scabbard, so I sanded off the outline before adding the new tubing frame.

**Extra windshield details.** Now, with the most noticeable errors corrected or concealed, I added a number of small details to each model. The windshield is a good place to begin. The Tamiya model needs windshield wipers, and Fig. 7 shows the standard manual crank type. Late-production jeeps had vacuum-operated wipers, and the Italeri windshield has the motors but the housings are too small. I made larger housings using the waste plugs from parts 92 and 93, cementing them in place after flattening them to an oval shape with a file. I also added manual cranks to the wiper motor housings.

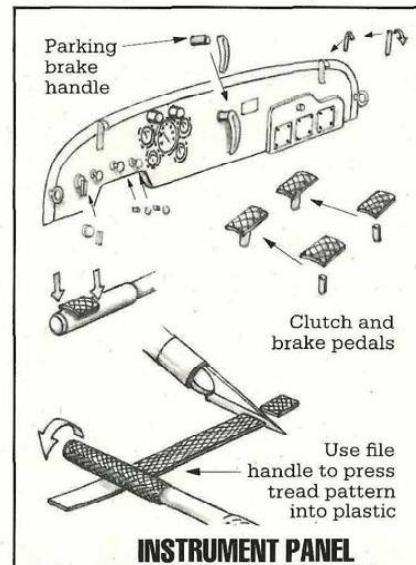
Figure 7 also shows how to make the slotted windshield clamp strips. If you haven't made something like this before, note that the cutting sequence is important: Cut and shape the center slot first, then mark the width on each side of the slot and cut with a razor saw held flat against the surface and horizontal so the cut is made all at once and does not tear the thin material.

I also added windshield and hood hold-down clamps, as the molded clamps are too small and some are missing. I used short chips of plastic rod and bits of stretched sprue to make up small "T" shapes, then cemented them in place.

An important windshield detail that I should have included on at least one of the jeeps, but didn't, is a cover for the lowered windshield, Fig. 8. This cover not only protected the glass, but also prevented reflections that might be seen by enemy observers. General Patton repeatedly stressed the importance of covering lowered windshields to prevent such reflections. The covers were widely used in Europe, and even raised windshields were often deliberately left dirty to reduce reflections. To model the canvas cover, pre-paint the wind-



**FIG. 9  
MAKING A WINDSHIELD COVER**



**FIG. 10  
INSTRUMENT PANEL  
DETAILS, AND PEDALS**

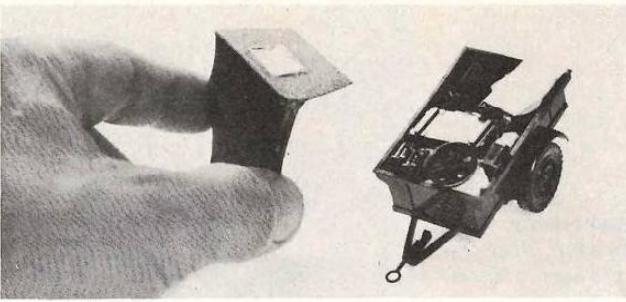


Fig. 11. The author cemented facial tissue over the Tamiya top to improve the fabric texture, and built a dummy load for the trailer from various nondescript spare parts.

shield frame and wrap it with trimmed tissue, then cement with white glue, Fig. 9. The real covers fit fairly well, so the tissue should be stretched to eliminate large wrinkles and folds.

**Panels and pedals.** Both kits have minor errors in the instrument panels, Fig. 10. The most prominent new detail is the parking brake handle, which should be separate from the panel instead of molded in place. I made the hold-down hooks for the windshield from chips of sheet plastic, and other details include eyes on the sides of the cowl for the safety straps over the door openings, latch buttons for the toolboxes, and separate clutch and brake pedals. A quick trick for the pedals is to press a safety tread pattern into the plastic by rolling a knurled file handle over it, pressing hard to imprint the pattern.

I improved the texture of the top on the Tamiya jeep by covering it with facial tissue, using liquid plastic cement as the adhesive. The tissue provides a rough, fabric appearance and adds lots of realistic folds and wrinkles, Fig. 11. I also replaced the solid plastic rear window with a piece of heavy cellophane to reproduce the uneven surface of the flexible window. Add this window before covering the top with the tissue paper overlay so the tissue can be trimmed



Fig. 14. This Military Police jeep mounts one of the many variations of the .50 cal. Browning installation. Also note the windshield adjustment clamp and the wiper motor housing.

to fit and hide the edges of the cellophane.

**Cross-kitting a machine gun for the "peep."** I mounted the .50 cal. Browning machine gun from the Tamiya kit on the Italeri jeep, building it as a reconnaissance "peep" in France. (Jeeps assigned to armored units were often called "peeps.") The Tamiya stanchion mount for the .50 is simplified, so I reworked it. I have seen photos of a field-manufactured mount just like the one Tamiya provides, but it was used with an air-cooled .30 cal. Browning. The weight of the .50 M2HB machine gun required the standard flexible cradle mount found on .50-armed U. S. vehicles. The easiest way to model it is to find a suitable cradle from another kit, but lacking that, the existing parts can be modified, Fig. 12.

The Tamiya .50 is basically accurate, but simplified. The rear double spade grips come molded as a solid bar, so I removed the center of the bar with a round file, opening up the space behind the receiver, Figs. 13 and 14. Trim the handles until they are round, then thin the upper and lower handle forks with files. These should be as thin as possible, since the originals are thin metal plates.

Further optional changes I made include drilling out the holes in the barrel jacket and opening up the cradle gun mount molded to the gun. These are tedious, but the improvements are noticeable. The barrel changing handle came from another gun, thinned down as much as possible. This handle can also be made from very fine sprue or wire.

**Modeling stowed gear.** Packs, bags, clothing, and other cloth gear can be reproduced with facial tissue, moistened with water and folded to the proper sizes and shapes. Add flaps, straps, buckles, and fasteners with strips of tissue and bits of plastic sheet attached with white glue. Heavy rubber and rubberized canvas tarps, bedrolls, and covers are best reproduced using heavyweight aluminum foil or the thin metal from toothpaste tubes. The thin metal, when painted, simulates the smooth, shiny surface of rubber tarps, Fig. 15.

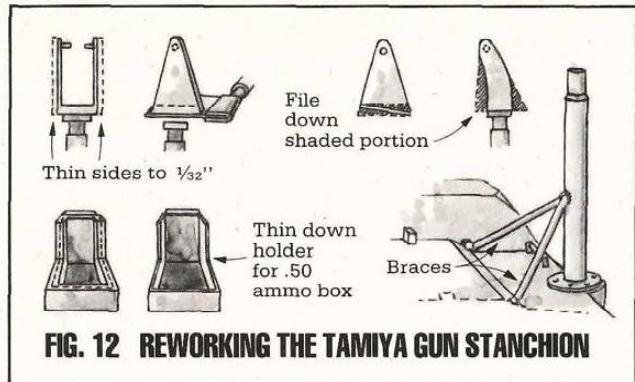


FIG. 12 REWORKING THE TAMIYA GUN STANCHION

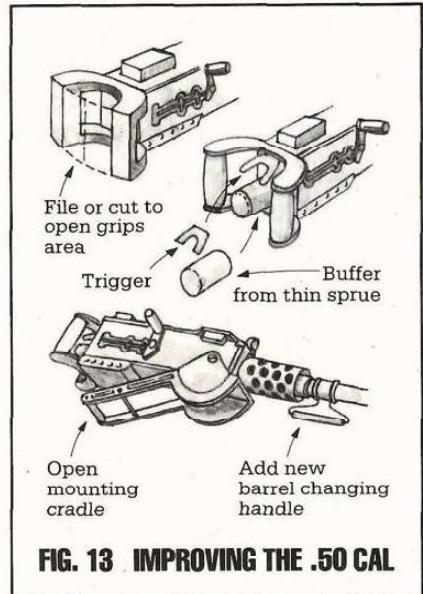


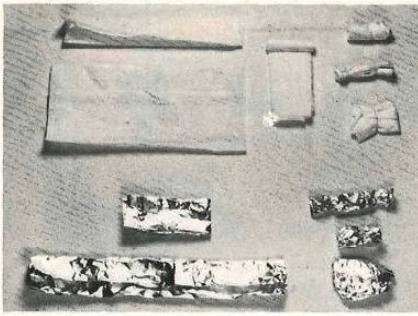
FIG. 13 IMPROVING THE .50 CAL



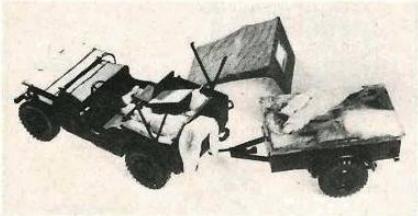
## Meet Bruce Culver

Bruce Culver is 41 years old, and has been building models for over 20 years. After joining IPMS in 1966, he wrote several articles for the *IPMS Quarterly*. He has also written a number of magazine articles and several books on AFVs and military modeling, and has worked on pre-production research for plastic model kits.

Bruce lives near Dallas, Texas, and works as a technical writer at the Vought Corporation. Besides modeling, his interests include military technology, photography, model kit design, and flying. He is a member of IPMS, the AFV Association, the Military Vehicle Collectors Club, and a replica home-built aircraft group in the Antique Airplane Association.



**Fig. 15.** Facial tissue folded several times lengthwise, then rolled or folded, makes convincing bedrolls, tarps, or other cloth stowed items. Metal foil is better for simulating rubber and rubberized fabric items.



**Fig. 16.** The Tamiya jeep and trailer before painting, showing the stowed equipment and the tissue cover on the trailer.

When adding stowed equipment to your models, remember that the real things are heavy. Soft items should be punched down, even crushed, by the weight of stuff piled on top of them, and unsupported packs should sag under their own weight. Generally, if you make stowed equipment look heavy it will look right. After arranging the stowed items in the model, dampen the tissue slightly so it will retain its shape. When dry, remove the equipment and paint it separately, but be sure you weather it with the vehicle.

**A dummy trailer load.** The Italeri kit provides no equipment for the trailer,

and the Tamiya kit furnishes only a partial load, so I made up a dummy load for the Tamiya trailer so it would look full, and saved the detailed kit equipment for use on other models or dioramas. The dummy load is made of scrap shapes representing boxes, bags, cable reels, field packs, clothing, and anything else that soldiers might scavenge and hide under the tarp. Once the shapes were in place, I draped a tissue tarp over the load, moistened it with water to make it hold its shape, Fig. 16, trimmed it and added paper straps, then painted and weathered the tarp along with the trailer.

**Finer front and rear bumpers.** Figure 17 shows the changes to the bumpers. Remove the front bumper from the frame and hollow it out by cutting slots with a razor saw and removing the material between them with a knife and files to make a girder-like "C" section. Using a motor tool reduces this to a 15- or 20-minute job, but it can be done with hand tools. Re-install the bumper, making sure it is properly aligned.

File each of the rear bumperettes to a thinner cross section using a rattail needle file; this takes only 15 or 20 minutes, and the improvement is noticeable. If the file won't fit into the molded opening, twist it like a drill until it penetrates up to the handle, then use short strokes to remove plastic from the inside of the bumperettes.

One common field-applied accessory on jeeps in northern Europe was a vertical wire cutter bar welded or bolted to the front bumper. Of the many booby traps left behind by the retreating Germans, the thin decapitation wire strung across a road was one of the most feared, because jeeps were often driven with the windshields down. Wire cutter bars came in all shapes, and most were fashioned from steel bars or angles, Figs. 18 and 19. Figure 20 shows four variations, including the one I made for my reconnaissance "peep."

**Bullet holes.** Unless you are modeling a jeep hit by a 75 mm projectile, true scale-size bullet holes are relatively hard to see. A 1/35 scale .30 cal. or 8 mm bullet hole should be only one one-hundredth of an inch (.010") in diameter, smaller than the smallest numbered drill (No. 80), and barely visible. One place the holes will show up, however, is in the windshield, and I added them to my second Tamiya jeep (the one with the in-between weathering). Drill a No. 76 or 77 hole for each bullet strike and scribe cracks, Fig. 21. Battle damage is easy to overdo, so keep the detail subtle.

**Paint and markings.** Even though I planned to weather them heavily, my first step in finishing the jeeps was to paint each in factory-new condition with all service and tactical markings. Because WWII U. S. vehicles were painted just one standard color — olive drab —

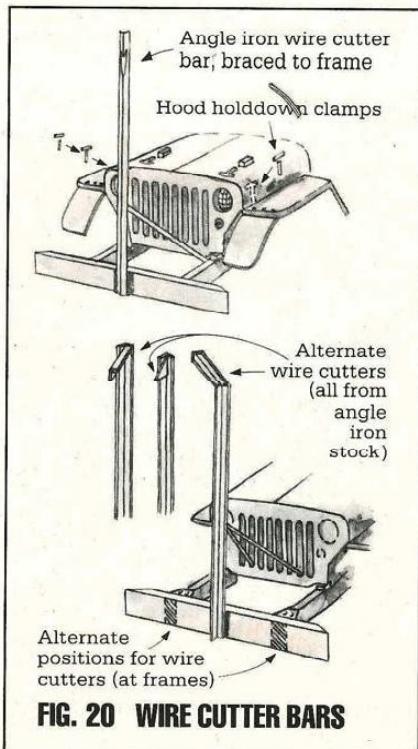
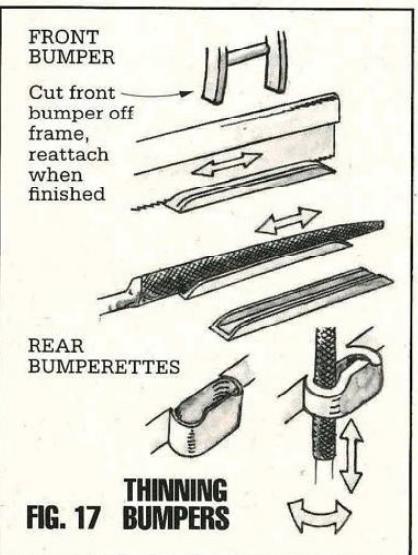


Both photos, U. S. Army

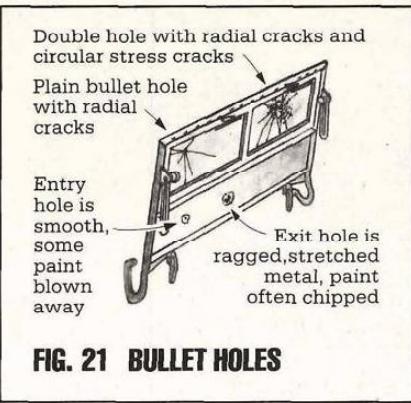
**Figs. 18 and 19.** These photos show the two most common forms of wire cutters. There were many other variations.

I spray painted the models after assembly.

In fact, the U. S. scheme is so monotonous that it's difficult to introduce color variations; all G. I. pioneer tools (shovel, ax, mattock) were painted olive drab, and even the seat cushions and tool pouches were olive drab canvas. To add just a little interest I finished the pioneer tools to represent



**FIG. 20 WIRE CUTTER BARS**



**FIG. 21 BULLET HOLES**

well-used items, with paint worn off the heads and handles, and painted the seat cushions an off shade of o.d. I made the cushions a shade lighter than the vehicle, since new cushions were usually lighter than the fresh paint, and faded faster, too.

To simulate the jeep's black instrument faces with white markings, underpaint the dials with white, let dry, then paint the dials black and scratch the markings through the top paint layer. Use gloss varnish to represent the glass over the dials. The rear lights and reflectors were colored glossy plastic, and gloss varnish, used sparingly, will also reproduce this.

**The idea of scale effect.** An important concept in all model finishing, especially weathering, is "scale effect." Simply stated, this means finishing the model so that it looks like the real thing at normal scale viewing distances. This means taking into account that as an observer moves farther from an object, its colors seem to fade and blend — color intensity and the contrasts between colors apparently disappear.

Viewing a 1/35 scale model from one foot away is the equivalent of looking at the real thing from 35 feet away, two feet equals 70 feet, and so on, and if we wish to take this into account we should paint and weather models so they appear as the real objects would from those scale distances. This means that colors should be subdued. Light colors need not be darkened, but bright colors



**Fig. 22.** Sprinkling sifted clay soil over the model is an easy way to achieve realistic dust and dirt deposits. Scrubbing with a brush, shown here, is a technique also used with ground pastel chalk.



**Fig. 23.** After the chalk powder and sifted dirt were applied and fixed with a clear flat spray, Bruce painted on dried mud deposits with straight-from-the-bottle flat model paint (Humbrol).



FINESCALE MODELER: A. L. Schmidt

**Fig. 24.** The completed Italeri "peep" carries moderate dry and dusty weathering effects with only thin dried mud deposits. No details are obscured.

should be grayed to reduce their intensity. All dark colors, especially black, should be lightened.

**Developing a "weathering history."** Before weathering the jeeps, I created an imaginary "history" for each model. This need not be long or involved, but before you start applying weathering effects you should have a clear idea of the vehicle's imaginary recent use so your effects will be plausible. Give some thought to the imagined time of year, weather, type of terrain and soil, and

the use of natural camouflage materials.

In addition to material deposited on the vehicle — dust, mud, salt stains, and so forth — weathering involves the effects of paint fading and deterioration. Olive drab faded to various brown-olive or green-olive shades depending on the paint itself, the age of the vehicle, and its environment. Vehicles in northern Europe and Italy did not fade as rapidly as those in Africa or the Pacific theater, but older vehicles everywhere looked pretty ratty. I aged the

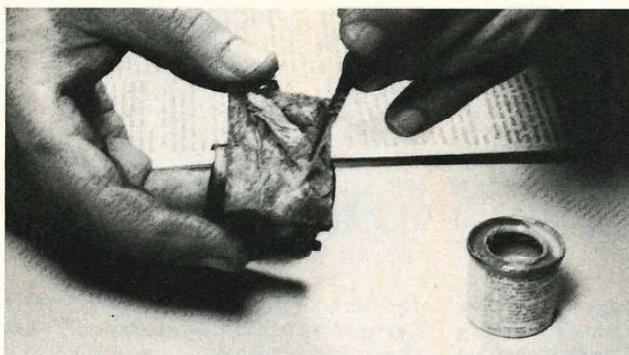


**Fig. 25.** Mud! Even sure-footed jeeps can get stuck. Note the fresh deposits of darker wet mud on the lower parts of this jeep, and the offset wire cutter bar.

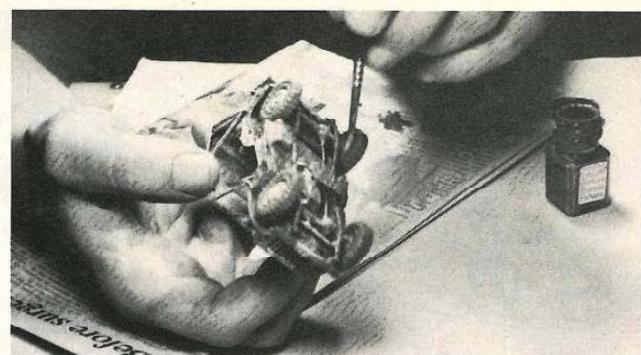


**Figs. 26 and 27.** The heavy mud on Bruce's Willie-and-Joe jeep is a mixture of fine sifted clay soil and white glue. After mixing, the thick soil-and-glue mud was stippled onto the model with a brush, duplicating the patterns of mud deposits shown in photos.





Figs. 28 and 29. After the mud mixture dried, the model was finished with paint. A flat enamel color representing dried mud was



applied first (left, above), then a darker wet-mud color (right, above) was used on the thick, built-up mud.

paint on these models before weathering them, using a combination of standard airbrush, dry-brush, and pastel scrubbing techniques.

**A dusty look for the "peep."** I first weathered the Italeri jeep, the one with the cross-kitted .50 cal. As I mentioned earlier, this model represents a reconnaissance jeep in France late in 1944, and the basic effects are those of dusty, dry weather.

I started on the model with pastel chalks, then switched to real soil. Both worked fine. Ground-up pastel chalk sticks are especially good for representing distinctive soils such as red and yellow clays and black or gray volcanic ash. Rub earth-colored pastel sticks on medium-grit sandpaper to make a powder, then apply it with a moderately stiff brush. I prefer a short camel hair or sable brush to bristle brushes, which can scratch the paint.

Work the pastel powder into the surface of the model with a scrubbing action. By varying the pressure on the brush, various dust, dirt, and staining effects can be produced. The harder you scrub, the more color is forced into the paint and the sharper the edges of the pastel-colored areas.

Real soil works just like powdered pastels, maybe better. Ideally, soil used for weathering should have a high clay content. When dried thoroughly and sifted to remove pebbles and grains of

sand, clay soils can be ground into a fine powder. (The color is, of course, natural.) I sifted the soil directly onto the jeep, then shook off the excess, leaving a light coating of dust. Apply heavier dust coats by scrubbing the soil into the paint, as with pastels, Fig. 22.

I fixed both the chalk dust and the soil to the model with a spray of clear flat finish, then stippled earth-colored paint on the bumpers, sides, wheels and wheel wells, and hood to represent dried mud, Fig. 23.

**Weathering tires and windshields.** An important aspect of the dusty brand of weathering used on the "peep" is the appearance of the tires. Tires have a rough, almost porous surface that holds dust and dirt, and on a dry, dusty road they will pick up more dust and dirt on the tread than on the sidewalls, so the tread color will be lighter. On a clean or wet paved road, however, the tread will soon be scrubbed clean of most dust and dirt, and tread areas will have clean black rubber raised patterns. I chose the dry dirt road treatment, and stippled the same dried-mud color paint on the treads as I did on the rest of the jeep, leaving the sidewalls relatively clean.

Finally, I masked the clean areas of the windshield with tape and treated it with the same chalk, dirt, and paint used on the rest of the vehicle, Fig. 24. Then I stopped weathering — which is

one of the hardest but most important steps in the process. Always stop weathering *before* you think you have done enough, because it's easy to get carried away — and removing overdone weathering is often next to impossible.

**Researching — of all things — wet mud.** Next I reached for the Tamiya jeep with the top and the trailer, the one I planned to do as a mud-covered Willie-and-Joe special from the Italian front, Fig. 25. I checked my reference photos, then went looking for as many unwashed cars and trucks as I could find. Vehicles used off paved roads, such as pickup trucks and 4 x 4s, are especially worth studying. Try to find at least one vehicle with fresh mud deposits so you can see the differences in color between wet and dry mud. Wet mud is always much darker — by several shades, in fact — than dry dirt or dust, and even yellowish-tan soil turns almost chocolate brown when wet.

Mud buildup on wheels, tires, and body parts is deposited by splashing and splattering. The mud itself may be nearly dry clods of earth, a thin soupy slurry, or any consistency in between. A coating of thin mud looks like a sloppy paint job, while thicker, half-dry mud clods can build up layers several inches thick. Generally, in 1/35 scale, the thickest layer of simulated mud should be no more than  $\frac{1}{32}$ " thick.

**Modeling thick mud.** Building up layers of mud requires a three-dimensional modeling technique, and I've used several methods, among them: thick (unstirred) model paint; acrylic modeling paste; white glue; and mixtures of white glue or thick paint with thickeners such as talcum powder, cornstarch, or fine powdered dirt. Adding a lot of talcum or cornstarch to white glue usually results in a "baked desert" random-cracked appearance, so if you try that method, don't add too much.

For the mud on my Willie-and-Joe jeep I used a mixture of white glue and finely sifted clay soil, Fig. 26. I applied the goop with a short brush, using a stippling technique, Fig. 27. After the mixture had dried I painted it to represent a combination of wet and dried



Both photos, FINESCALE MODELER: A. L. Schmidt

Figs. 30 and 31. The completed Italian campaign jeep wears about the heaviest coating of mud you can get onto a jeep and still have it move. Few operational vehicles stayed this filthy for long.



mud and to blend the heavy mud deposits into the surface.

I started painting by stippling the lighter dry-mud color over most of the upper portion of the jeep, Fig. 28, carefully wiping it off the seats and steering wheel where the mud would be worn off by the crew. To achieve a streaked look, I cleaned the segment of the windshield swept by the wiper by rubbing it with a wooden toothpick in a curved side-to-side motion.

Next I stippled on the darker wet-mud color, always starting in the center of the wet area and stippling out toward the dry, Fig. 29. This blends the colors naturally. After painting, I gave the wet-mud areas a coating of clear, semigloss varnish to simulate moisture, Figs. 30 and 31. Remember that thick mud dries from the outside, and that water seeping from the wet interior keeps the outer surface damp until all the moisture has evaporated. Don't be tempted to make the surface too glossy; in 1/35 scale even sopping-wet mud would appear semigloss.

**The in-between jeep.** The third jeep, the Tamiya model with the bullet holes, was weathered in about 30 minutes flat. This vehicle represents one that has been through muddy country, but it doesn't have the heavy buildup of the version from the Italian campaign.

After dusting the model with sifted soil, I applied thinned white glue to areas that were to represent dry mud and dumped fine soil over the glue, shaking off the excess. Then, without waiting for anything to dry, I made a mixture of fine soil and white glue, and applied it to simulate damp mud. When the white glue dried the damp mud remained a suitably darker shade, so no painting was required, Fig. 32.

Did I enjoy building and weathering three jeeps? Sure did, and I hope they'll spark you to try similar projects and develop your own distinctive modeling techniques. If nothing else, finishing these three similar models in three different ways proves that there's no single "right" way to do anything in modeling.

**FSM**



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**Fig. 32.** The third jeep was also weathered with white glue and sifted soil, but the mud coating was not painted after application. The effect is slightly different.

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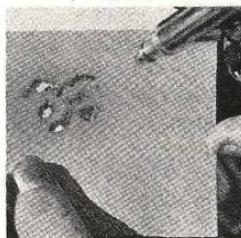
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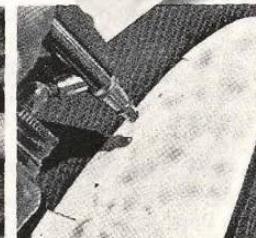
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Two camouflage tips are shown here:



1. Using a mask as shown, spray through the openings, move the mask over the next area to be sprayed. Hold the mask at least 1/2" from surface for a soft edge effect.



2. Another way to achieve the mottled effect is by free-hand spraying. Set the spray width to fine and hold the air-brush close to the surface using tight, erratic hand motions.



Good proportions, smooth surface, attention to details, and the fine wire wheels make it impossible to tell the scale from the photograph. The model is about three inches long.

# Building your first cast-metal car kit

A 1/43 scale Mexican Road Race Ferrari

**BY WAYNE E. MOYER**

**A**LTHOUGH IT WAS ONLY run from 1950 through 1954, the Carrera Pan American de Mexico, better known as the Mexican Road Race, may have been the most difficult race of its time. It was certainly the most underrated.

**About the Mexican Road Race.** On paper it looked simple — just drive up the Pan American Highway from the southern border of Mexico to the northern border faster than anyone else. Sort of a legal, crosswise Cannonball Rally. To make it easier (and give time to fix the cars), it was broken into eight stages over a period of five days so the drivers got the afternoons and evenings off. Piece of cake, right?

Well, for starters, it was almost twice as long as the similar but famous Mille Miglia — 1,934 miles compared to 1,000. The road, miserable in places, rose from sea level to more than 10,000 feet and back down again.

Unlike other mountain courses (Targa Florio or Nürburgring) there wasn't much chance to learn the course. It was just one-way, up and down, from Tuxtla Gutiérrez to Ciudad Juárez. The first day's run alone had more than 3,800 turns. Le Mans goes on for 24 hours straight, and has the famous long Mulsanne Straight. But at Le Mans, the object is to finish the 24 hours as slowly as you can and still win. In Mexico, it was to be first. Period. Nothing else counted.

There were several straights of ten miles or more where the big sports cars

ran flat-out at 170 mph. A mistake could put you airborne off a mountain switchback. Only the strong entered, and the strongest won.

Because the race was relatively unknown, full factory teams were few and far between in the sports car class. Most of the cars were private entries driven by amateurs. In 1953, two young Californians, Phil Hill and Richie Ginther, combined to drive a 4.1 Ferrari entered by Alan Guiberson. Their course reconnaissance consisted of driving the car down to the starting point. They soon made the inevitable mistake and took a backwards trip down a rocky mountainside.

Undaunted, Guiberson bought a Vignale-bodied 375MM roadster (in fact, the factory car that won the 1953 Nürburgring race) from Ferrari. With a displacement of 4.5 liters and 340 horsepower, it was a car to go racing with, and with Hill driving and Ginther navigating, the pair entered the 1954 race. They finished second overall, only 24 minutes behind Maglioli's factory-entered Ferrari. The drive so impressed Ferrari that Hill was later offered a place on the Ferrari team: The rest is history.

**F.D.S kit No. 67.** The only kit of the Mexican Road Race Ferrari is the F.D.S.



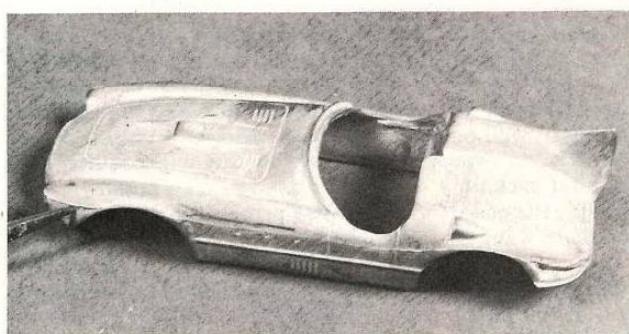
**Fig. 1.** Components of the F.D.S. Ferrari kit. It's not a complex kit; simplicity, good castings, instructions, and decals make it an excellent first cast-metal model.

**Fig. 2.** Everything you need to build the model: X-acto knife and files, wet-or-dry sandpaper, putty, and primer.

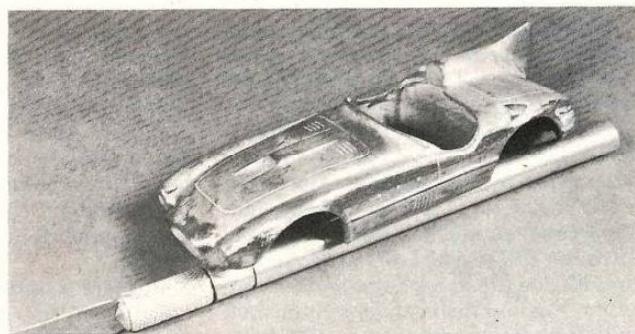
No. 67 cast-metal kit in 1/43 scale.\* It's a very nice kit, with few parts, good castings, and good decals, Fig. 1. Building a cast-metal kit is no different than building in plastic — the tools and techniques are the same, you just apply them a bit differently, Fig. 2.

\*Available from Auto Racing Miniatures, 8401 Osuna Road N.E., Suite C, Albuquerque, NM 87111, for \$20.00. A.R.M. carries the full line of F.D.S. kits, as well as many other cast-metal race car kits, and offers a building service as well.

In Canada, Mini-Grid, 70 Pebblehill Square, Scarborough, ON M1S 2P7 handles the full line of F.D.S. decals and kits.



**Fig. 3.** The mold line running around the body (above the file point) must be removed — needle files in various shapes work well for this operation.



**Fig. 4.** The body casting after filing. The next step is sanding with No. 320 wet-or-dry sandpaper.

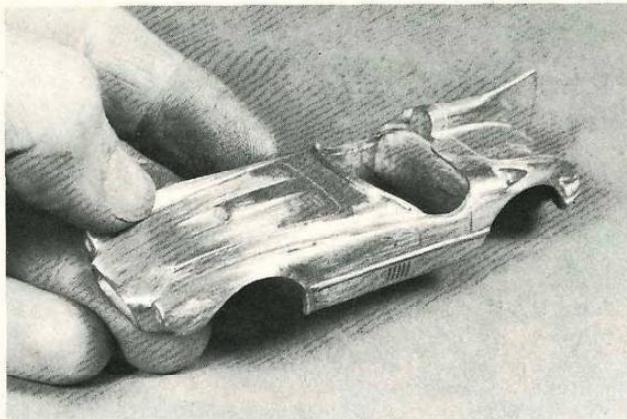


Fig. 5. Sand the filed areas smooth, and wet sand the entire body. Wash thoroughly, and it's ready to be primed.



Fig. 6. The first primer coat will reveal some surface blemishes. Here Duratite Plastic Surfacing Putty is being applied to a deep spot with a palette knife.

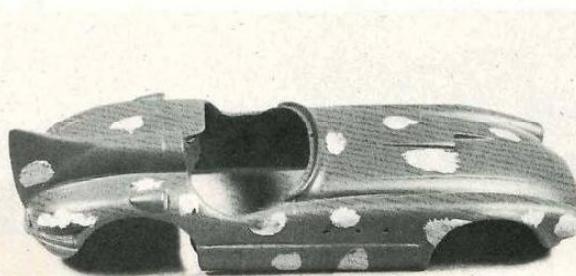


Fig. 7. Shallow blemishes are easily filled with a brush load of thick Du Pont primer.

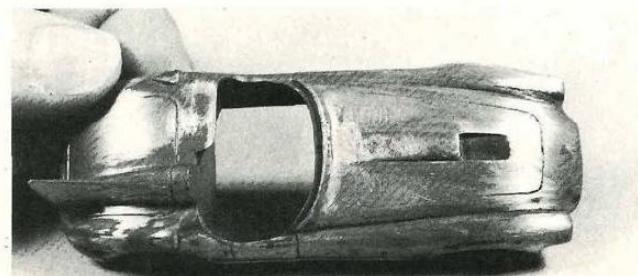


Fig. 8. When the body is thoroughly wet sanded, primer will remain in the low spots, filling them nicely. Now prime again.

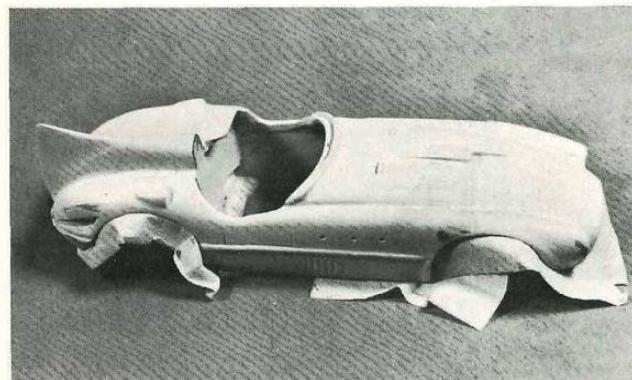


Fig. 9. After you've got a smooth primer coat, spray the interior flat black and mask it off.

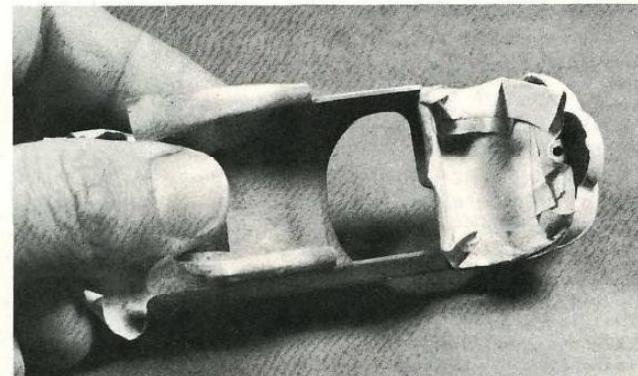


Fig. 10. Mask the black areas of the interior and spray the cockpit with Humbrol Leather.

**Cleaning the parts.** The first step in building a metal kit is to clean up the castings, Fig. 3. There are usually mold lines to remove, and if the mold was overfilled, there may be flash, Fig. 4. Mold lines should be filed off — X-acto makes files in various shapes that work well. The metal is soft, so take care not to remove too much. After filing, sand with No. 320 and No. 400 sandpaper to smooth the file marks and restore contours, Fig. 5. Flash can be trimmed off with a modeling knife. I save old blades because those that are too dull for plastic still cut the soft metal quite well.

Once the parts are cleaned up, check

the major pieces for fit. On some kits you may have to do a bit of filing or bending to get a good fit — but be sure to allow for the thickness of the primer and paint coats. Everything fit well on the F.D.S. Ferrari, but the fin was bent. No problem; just bend it back until it's straight. Unlike plastic, the metal will stay bent, just where you want it, forever.

**Primers and fillers.** Once you're satisfied with the condition of the parts, wash everything thoroughly with detergent and hot water to remove mold release oil and sanding dust. This step is important; do it right. Rinse the

model, let dry, and apply a coat of metal primer. I use Floquil R601 Zinc Chromate because it fills and sands so well, but if you don't have an airbrush, a spray can primer (Tempo, for instance) will do, but will require more sanding to get a smooth finish.

That first primer coat will show lots of nicks, scratches, and blemishes on what you thought was a smooth surface. Shallow pits and file scratches can be eliminated by simply sanding the area down to bare metal — the primer will remain in the blemish and fill it. Deeper spots should be filled with thick primer and sanded smooth. Du Pont

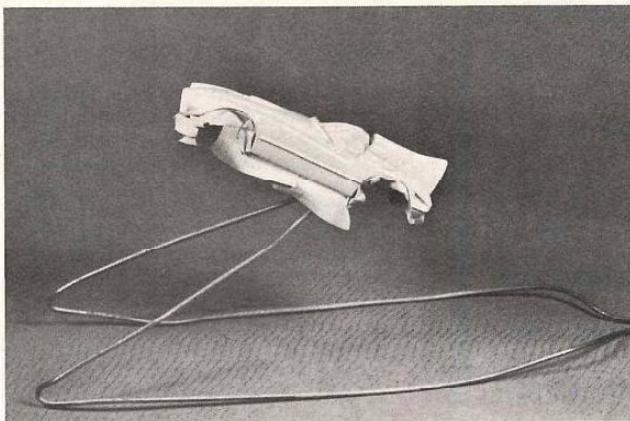


Fig. 11. The interior is masked, the body is mounted on a bent coat hanger spray stand, and Testor gloss white paint applied. Let the paint dry for several days.



Fig. 12. After the lower panels are painted, brush on a coat of Future (or spray on a clear high-gloss varnish) and apply the decals. Note that the chrome strip goes on before the decals.

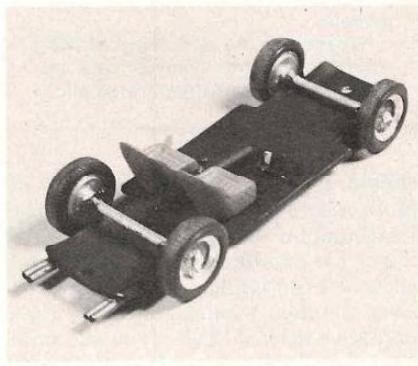


Fig. 13. The assembled chassis. Seats are painted Humbrol Leather and then buffed to a sheen. Cut axles by the fit-and-try method to get the wheels inside the body, then attach with Hot Stuff Super T.



A good kit and a few hours of patient work yield a model that compares favorably to any factory-built product.

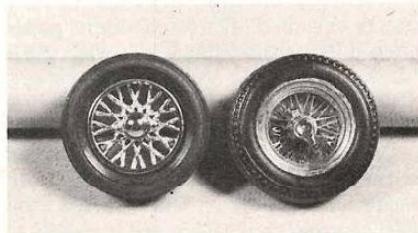


Fig. 14. The F.D.S. kit wire wheels (left) are nicely cast and chromed, but the Precision Miniatures photoetched Boranni wire spoke wheels (right) are much more delicate and realistic.

lacquer primer is very thick (I dab it on with a small brush), dries quickly, and sands easily. Really deep spots should be filled with your favorite body putty and sanded — if you removed too much metal with the file, build the contours up with putty, too, Figs. 6 and 7.

After sanding, wash the body, spray on another coat of primer, and inspect it carefully. If any blemishes or uneven spots remain, wet sand with No. 600 sandpaper and prime again. Repeat this process until the body is smooth — a smooth primer coat is the secret to that

smooth, glassy finish, Fig. 8. Incidentally, I usually switch to Floquil R9 Primer (gray) for the final coat as it's harder and more durable than the Zinc Chromate.

**Color coats.** I sprayed the body interior and both sides of the chassis plate with flat black. When that dried, the interior was masked and the cockpit sides and seats were sprayed with Humbrol Leather, Figs. 9 and 10. That, when dry, was gently buffed with a soft cloth to produce a realistic leather luster. The cockpit was then masked and the body taped to a bent coat hanger support for spraying the white exterior finish, Fig. 11. I airbrushed Testor Gloss White overall, but a spray can could be used here too. I allowed the white to dry several days, then painted the lower portion of the body dark gloss blue. The chrome strip made an excel-

lent dividing line for masking here.

When all the paint was dry, I applied a coat of Future floor wax with a Q-tip. Future dries quickly, has a high gloss, and protects the paint from smudges and fingerprints — they just wipe off. While it was drying, I picked out the engine and exhaust detail with Pactra Steel and Flat Aluminum.

The next step on this model was to cover the chrome trim strip around the body with Bare Metal Foil.\* There's no way silver paint can do this job as well. When the body is dry (it's still on the spray stand), apply the decals and do any trim painting, then apply another coat of Future to seal and protect the decals, Fig. 12.

**Final assembly.** Final assembly is

\*Bare Metal Foil and Hobby Co., 19419 Ingram, Livonia, MI 48152.

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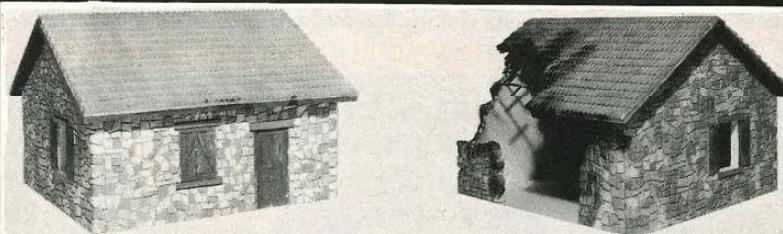
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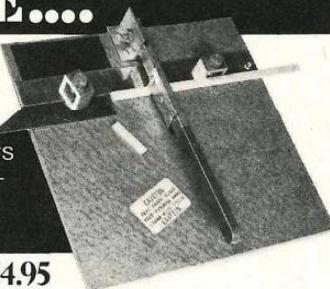


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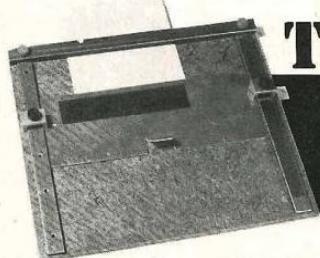
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**Meet Wayne Moyer**

Age 41, married, with four daughters, Wayne Moyer is an aerospace engineer at Wright Patterson Air Force Base where he's engaged in preliminary design projects. "I can't remember when I wasn't interested in airplanes, and I've been building models since anyone would trust me with a knife," he reports.

Wayne started building car models in high school but became really interested in sports and road racing cars while a student at the University of Cincinnati. He's been building 1/43 scale cars ever since John Day's first cast-metal kit appeared in 1970 and his collection now includes almost 400 1/43 scale cars (as well as 300 1/72 scale aircraft). He has been a member of IPMS since 1966 and is active in the Dayton Area Plastic Modelers chapter.

Wayne says he also enjoys driving sports cars and flying private aircraft; he's an instrument-rated pilot.

simple, Fig. 13. I use Hot Stuff for all glue joints — it's the best instant glue I've found for modelbuilding. Hot Stuff Super T is excellent for attaching small parts — headlights, mirrors, and so on. Even the clear windshield can be glued in place with Hot Stuff if you use small amounts. Too much, and the clear plastic will turn milky, but a coat of Future will usually clear up the plastic again.

The chrome grille can be improved by painting it with Polly S Flat Black, then wiping most of the paint off the "egg crate" with a damp cloth. The kit wire wheels are good castings that are nicely chromed. The instrument panel should be painted flat black with gloss black instruments and white markings. The steering wheel has silver spokes, flat black shaft, and a gloss brown rim.

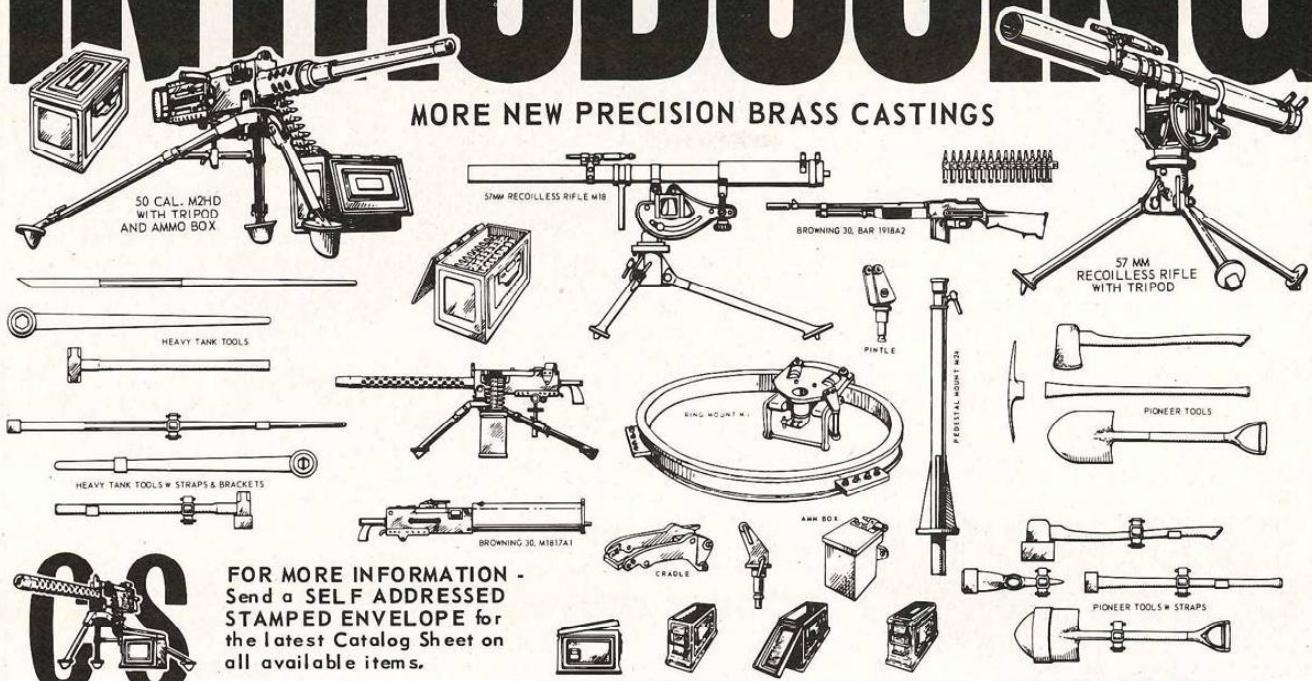
**Superdetailing parts.** Built right out of the box, the kit produces an excellent model of the Ferrari that started Phil Hill's career, but there are a couple of superdetailing additions that can enhance the model. Precision Miniatures makes a set of photoetched Boranni wire spoke wheels (P.M. 104), Fig. 14.\* They are easy to assemble (use Hot Stuff sparingly) and add something to any model, most especially to a Ferrari. The double-row wire spokes just can't be done this finely by casting. F.D.S. also makes a decal sheet of Ferrari badges and instrument decals, which I used instead of hand painting the instruments. They add a touch of realism to an open cockpit car that's difficult to achieve by painting.

Welcome to the world of cast-metal modeling. Whatever your automotive interest, there's a kit for you! **FSM**

\*Available for \$5.75 from Marque Products, 635 Paularino Avenue, Costa Mesa, CA 92626.

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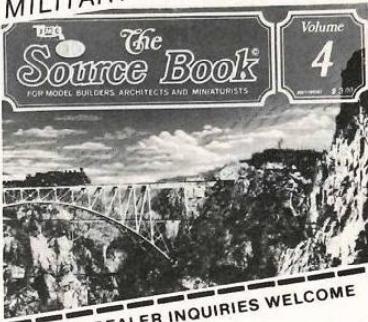
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This 1/25 scale 1953 Ford pickup was converted to a wrecker and weathered with all the techniques explained in the text.

## Realistic weathering for older trucks

Nine techniques you can use to age any model

Models and techniques by JOHN MAHAFFEY  
Text and photos by JACK GURNER

MANY OF THE TRUCK models seen in contests or on display look cleaner and newer than their full-size counterparts just off the assembly line. There's not a speck of dust, drop of oil, or patch of rust anywhere on these immaculate miniatures. However, a few modelers are beginning to take a more realistic approach by showing the effects of wear and tear.

**Research.** Just as with other types of modeling, research is the key to achieving realism. While aircraft or armor modelers visit military bases or museums, I go to truck stops and junkyards. A camera can just as easily record the detail of a modern naval vessel or the workings of a Peterbilt. Plenty of books and magazines are also available for vehicle enthusiasts.

The age of a vehicle, the amount of use, and the type of maintenance are

all factors that determine how a truck looks. The techniques presented here have been used to represent well-worn vehicles. However, simply by varying the application, the techniques can be used to simulate any degree of wear.

**Bends and dents.** Apply bends and dents to the model early in construction. Use heat to soften the plastic: Good heat sources include candles, soldering irons, hot knives, and even hot water. Whichever source you choose, be safety conscious and don't let the heat warp the plastic. Once the material becomes flexible, make bends and dents with the blunt end of a hobby knife or the rounded portion of a pair of tweezers. For badly damaged areas, tear and twist the plastic with needle-nose pliers.

**Rust holes.** Simulate rusting-through by first drilling small holes where the rusted-out areas are to be. Then thin

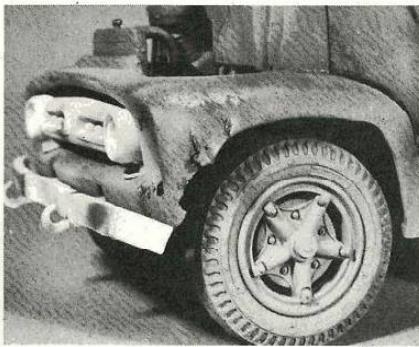


### Meet John Mahaffey

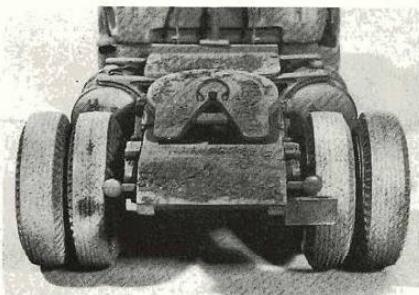
John Mahaffey, 35, of Memphis, Tennessee, has been modeling since 1953, and has specialized for the last 15 years in trucks (especially 1950s-era Ford pickups) and custom autos. He recently won *Scale Auto Enthusiast* magazine's 1982 Truck Modeler of the Year award for the 1953 Ford F-100 wrecker shown above. He's a past president of the Memphis Scale Modeler's Association.

Married, with three children, John works for Holiday Inn.

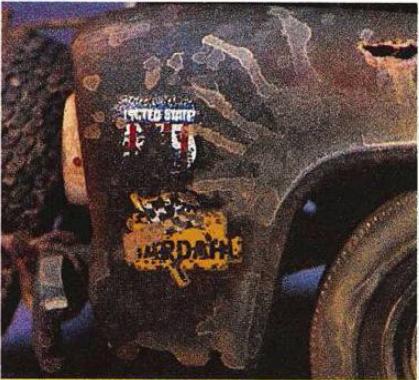
the plastic from behind using a motor tool with a high-speed steel cutter such as Dremel 141 or 144. Frequent stops will ensure that the plastic doesn't overheat and melt. Once the material is thinned to the point of translucency, push in with a blunt tool to create ragged holes.



The left front fender of a tractor. The torn and rusted effect was created by thinning the material with a motor tool equipped with a high-speed steel cutter and then tearing the thinned plastic with needle-nose pliers.



The clumps of rust on the fifth wheel were created by sprinkling real rust onto areas painted with a 50-50 mixture of white glue and water. The tire treads were "worn" with 600-grit sandpaper. The inside tire on the left has a molding defect that resembles an actual worn tire defect and adds to the realism.



The almost-gone Bardahl sign is a decal that was applied as usual and then covered with tape which was pulled off, removing most of the decal.

**Worn paint.** Trucks are often repainted several times over the years and various colors show through at worn spots. Duplicate this effect by applying several coats of paint to the model. The base coat should be a rust color: Several brands of weathering paint are available in aerosol cans or bottles. Brush painting is acceptable because



This wrecker was built from a '60s 1/25 scale AMT 1953 Ford pickup; the dents were made by heating the plastic and using the rounded end of a pair of tweezers to depress the softened material.



any flaws will add to the realism rather than detract from it.

The second coat should be a stock color for the type of truck you are modeling. Let the second coat dry thoroughly, then wet sand the model with 600 grit paper to expose some of the rust color, especially in areas that are subject to the most wear. Add more col-

ors and repeat the wet sanding procedure to reveal the layers of paint and the rust underneath.

Although one rust color is adequate for the base coat, use a wide selection of shades for detailing and bear in mind that many of the commercially prepared rust shades are a little too light to be realistic. Two non-weathering col-



The broken rear window on this tractor was simulated by using bits of glass from a broken microscope slide cover.

ors that represent rust nicely are Pactra's Hull Red (IN61) and Floquil's Boxcar Red (R74).

**Real rust.** Real honest-to-goodness rust can be used to simulate clumps on extremely rusted areas. Dilute white glue such as Elmer's Glue-All with an equal amount of water and apply the diluted glue to the desired area. Then sprinkle finely powdered rust over the glue. Once dry, simply blow off any excess.

**Worn signs.** Many trucks have company names, slogans, or advertisements painted on their sides. Waterslide decals are often provided in kits to represent these signs. Usually only bits and pieces are still visible on older trucks. To simulate this effect, apply the decal as usual and let it dry thoroughly. Then press a piece of tape over the decal and pull the tape off. The tape will pick up part of the decal and leave scattered bits of it attached to the model. Older, brittle decals work best for this technique.

**Real glass.** One method for simulating small areas of broken glass on a vehicle is to use microscope slide covers. (Those distributed by The Perfect Parts Company are often sold in hobby shops.) Cover both sides of the slide cover with tape and then strike it with a hammer. Pull one side of the tape loose and examine the bits. It may take several attempts to get broken bits that look right. BE CAREFUL: You are dealing with real broken glass. Attach the bits with white glue.

**Torn seats.** The effect of a worn-out seat can be accomplished by cutting out a section of the seat on the driver's side. Then paint the seat with white glue diluted 50 percent with water and cover the cut-out section with facial tissue. The seat covering will sag realistically. The effect can be heightened by slitting the covering and adding a few bits of foam rubber and a spring from an HO railroad car truck.

**Worn tires.** A well-worn truck usually has well-worn tires. Tire wear can be simulated by going over the tread with 600-grit sandpaper. Many model tires have molding defects that closely match the defects in worn full-size tires, an added bonus. While on the



This tractor is built from the same kit used for the wrecker shown on page 52, but widened five scale inches with the frame from a recent AMT Mack kit. The tractor's wheels are from an IMC tilt-cab Dodge.

subject, 1/35 scale two-and-one-half ton truck tires are usable as standard mud grips in 1/25 scale.

Although the techniques described here are aimed at truck modelers, they

can be adapted for use in other types of modeling: The main thing is to keep an open mind so that you won't overlook information that can improve your skills.

FSM



Western Tennessee-colored weathering adds to the homely appeal of a real junker.

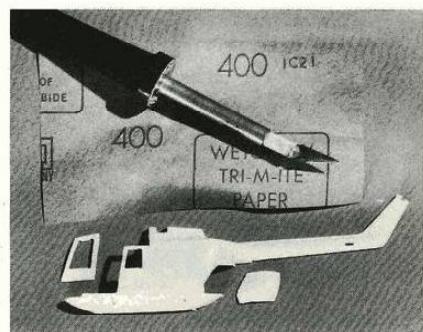


Fig. 1. Using a hot knife, Dennis cut out the doors from each side of the fuselage. The knife blade must be very hot, and only the tip of the blade must be used, or the plastic will become mushy. Smooth the cut edges with No. 400 sandpaper.



All photos, FINESCALE MODELER: A. L. Schmidt

Dennis modeled a C version of the MBB BO 105 in the markings and camouflage patterns of the Sudanese armed forces. He opened up the cockpit doors and cargo compartment clamshell doors and added accessories such as a rearview mirror.

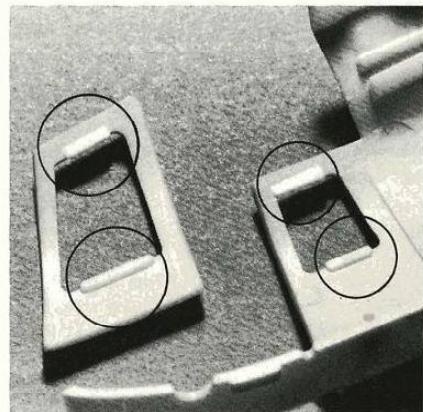


Fig. 2. For a cleaner appearance, remove the ridges inside the window openings.

## Modeling Ludwig Bölkow's versatile MBB BO 105 helicopter

Minor modifications to an excellent kit produce a 1/48 scale prizewinner

BY DENNIS MOORE

**B**ACK IN 1979 when I built my first helicopter, there was only a handful of chopper kits on the market. Since that time, a deluge of helicopters has hit the shelves in 1/144, 1/72, and 1/48 scales. The company that has led the field in this area is Fujimi, which has produced many of the world's more famous helicopters in all of these scales.

Fujimi's 1/48 scale model of the Messerschmitt-Bölkow-Blohm BO 105 appeared on the market in 1980 and has since been released in several other 1/48 scale versions. Fortunately, at about the time that I built this kit (Fujimi No. 5A-35) for the 1980 IPMS National

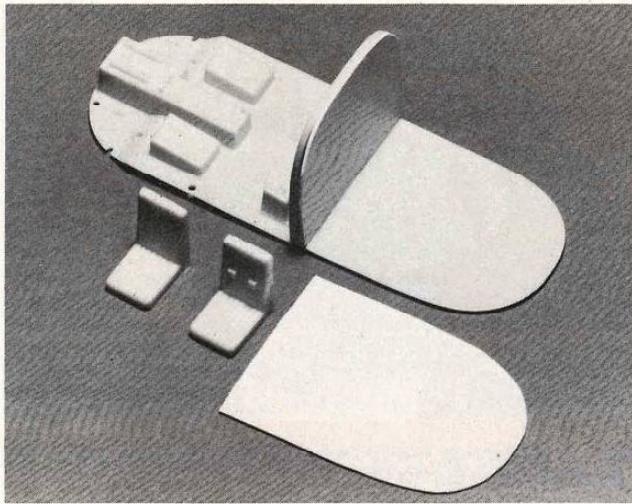
Convention, an excellent article about the BO 105 appeared in Vol. 16, No. 5, of *Air International*. This article was a godsend, because you discover quickly when you begin to build helicopters seriously that there is little documentation on them.

**About the BO 105.** The MBB BO 105 is a five-passenger turboshaft helicopter that was designed in Germany during the 1960s and early 1970s by a team headed by Ludwig Bölkow, who had a hand in the development of such planes as the Me 109K and the Me 262. The BO 105 was conceived as a light passenger and cargo carrier, replacing the venerable Alouette II in that role in a number of countries, and has also been developed as a ground-support aircraft

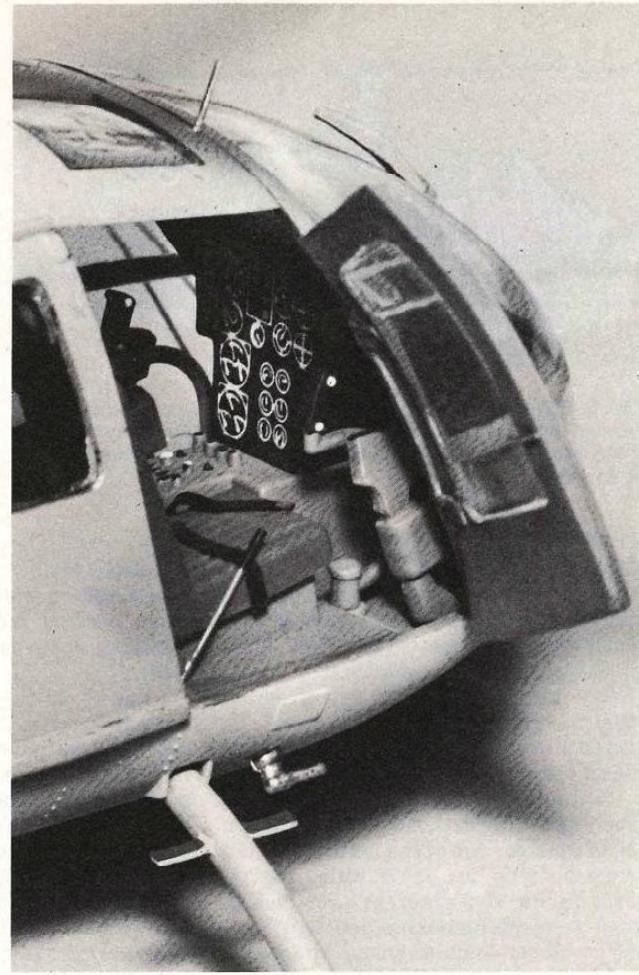
able to handle Hot missiles and unguided air-to-ground rockets.

Having a taste for aircraft in exotic camouflage and markings, I chose the C version of the aircraft that has been purchased recently by the Sudanese armed forces. Since I planned to take this model into competition, I first sat down with all of the drawings and pictures of the BO 105 I could find and prepared a list of modifications and additions I could make. I've found that this kind of checklist helps to solidify my thoughts and ensures that I don't forget anything during construction.

**Fuselage modifications.** The BO 105 has a cargo compartment with clamshell doors, and I decided to begin construction by cutting these doors away



**Fig. 3.** Dennis removed the cast seat belts from the front and rear seats and, using kit parts as templates, scratchbuilt a roof and bulkhead for the cargo compartment.



**Fig. 4.** The realistically folded seat belts are made of black vinyl electrician's tape with silver buckles.

**Fig. 5.** The main rotor assembly is built straight out of the box and is painted with Liqu-a-plate metallic finishes left unsealed.

from the fuselage, Fig. 1. I used a hot knife tipped with a No. 11 X-acto blade. I suggest that you make sure that the blade is good and hot before making the cut, since this will allow you to use just the tip of the blade. This is important because too great a contact with the heated blade will leave a large lip of melted plastic on the fuselage and the doors.

Once the doors had been cut free, I removed the small lip that had formed with an abrasive point on my Dremel Moto-Tool and with No. 400 wet-or-dry sandpaper used wet. I used exactly the same method to remove the front doors on the fuselage so that the cockpit could be viewed more easily.

You will also notice that all of the fuselage window openings have molded tabs on them to allow easy window installation, Fig. 2. These should be removed because they are unsightly and the windows can be installed without them.

Part No. 1, the cockpit floor, extends to the very back of the fuselage and can

serve as the floor for the cargo compartment. If you want to construct a roof to the compartment as I did, you can use part No. 1 as a template for making the required piece from sheet styrene, Fig. 3. You will also want to construct a bulkhead between the flight compartment and the cargo area by tracing the back-seat headrest, part No. 15. Set these scratchbuilt components aside for the time being as we move on to the cockpit.

**Cockpit modifications.** As you examine the cockpit components, you will notice that the front seats have belts molded into the plastic. These are to scale and can be used, but I chose to grind them down with an abrasive tip, follow up with some careful sanding, and install individual belts of my own.

The designers of this kit paid lots of attention to detail, the cockpit being no exception. I used all the parts provided, finding only the rotor brake handle missing, which can be constructed easily from a thick piece of stretched sprue and installed on the right side of the pilot's seat. Make sure that you remove

all mold marks from these pieces before painting. A fine abrasive point and your Dremel will make this step a lot quicker and easier, although you will still want to resort to fine sanding as a final step. Removing mold marks is a must in all phases of construction.

I ignored the kit painting instructions for the cockpit, painting most of it Pactra International Colors RLM Gray with the exception of the dash console, fire extinguisher, seats, and control handles. Helicopter control handles usually sport several control buttons which can be shown with red, yellow, and white paint.

I constructed the seat belts for the flight compartment from black plastic electrical tape, Fig. 4. I prefer electrical tape because it will stay in place, allowing me to duplicate the bends and twists found in the real item. To ensure that the tape doesn't come up later, I secure the belts with small amounts of white glue thinned with water and applied with a 0000 brush.

The buckles on the belts can be simu-



Fig. 6. Be prepared for a long search for decals when modeling planes used by small air forces. The Arabic numbers are from a Microscale decal set for MiG 17s and 19s; the Sudanese roundels are from E.S.C.I.

lated with silver paint. Since a cut-away drawing in the *Air International* article shows seat and shoulder belts in the front seats and three pairs of seat belts on the rear seat, I installed them in the appropriate positions.

The kit comes with a set of decals that includes a dash console front. To make sure it fits, trim and dry-fit this decal before you soak it.

**Rotor assemblies.** Having completed the flight compartment, you can move on to construction of the main rotor hub assembly and the main rotor, Fig. 5. Just follow the diagram provided in step 2 on the plans and you will have no problems. I again ignored the painting instructions and painted the rotor hub assembly with Liqu-a-plate Steel and the rotor blades with Liqu-a-plate

Aluminum.\* These two colors provided a realistic match with the shades shown in my reference material, so I used the same natural metal colors on corresponding components in the tail rotor system.

I don't like the look of Liqu-a-plate after it has been treated with Liqu-a-plate sealer, so I omit the sealer and let the plated pieces dry for at least 24 hours. Then I always wash my hands before handling the parts to make sure I don't leave fingerprints.

**Final assembly.** The roughest step in the construction of this model was fitting the flight compartment, scratch-built cargo compartment components, rotor assembly hub, aft exhaust mount, and air intake shield into place. This required extra time and dry-fitting before actual gluing. Once the fuselage halves were cemented together and the plastic along the joints had hardened, I wet sanded the seam.

I used Duratite Plastic Surfacing Putty to putty the gap between the floor of the cargo compartment and the fuselage shell. This brand of putty dries quickly and does not shrink, and after it dries overnight, it can be sanded and shaped to the right contours. Next, I added the skids, tail handles, horizontal stabilizers, tail radio dome, and air intake, and prepared for painting.

**Exterior painting.** Since most Sudanese aircraft employ a desert scheme, that's what I used as my camouflage pattern. Before painting, I masked off the rotor hub. I started by spraying the aft exhaust mount aluminum and the cargo bay, fuselage doors, and cargo doors RLM Gray. Next, I masked the cockpit and painted all topside surfaces with Pactra International Colors German Desert Sand, including part No. 32, the flight compartment roof. The lower section of the plane was painted with Pactra German Light Blue, including part No. 48, the air spoiler.

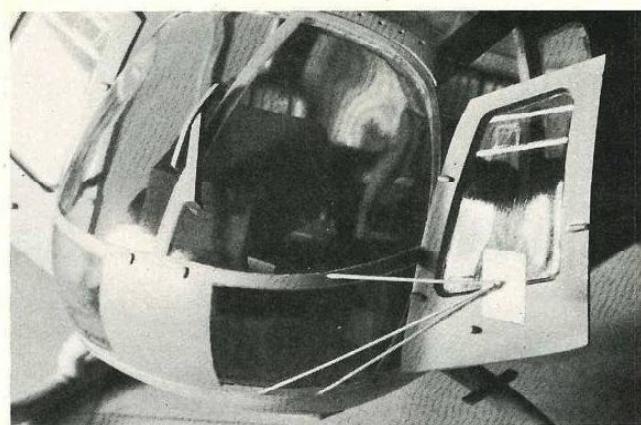


Fig. 7. A scratchbuilt windshield wiper and a rearview mirror add visual interest to the BO 105.

All of these desert schemes have an uneven, soft break between the top side and bottom side colors, so I carefully masked and retouched this area. Finally, I applied the Pactra International Colors German Dark Green and Italian Gray.

At this point I applied the decals to the fuselage, Fig. 6. I used E.S.C.I. Sudanese roundels and tail flashes.\*\* I employed part of the Microscale system, applying a coat of gloss before mounting. Since these decals are inclined to silver badly, trim the clear edges before soaking. Make sure that you position these decals so that they don't sit on rivets or panel lines, because they are thick and do not settle well. I also suggest a thin coat of diluted Elmer's Glue-All on the back of each decal before mounting to prevent

\*Liqu-a-plate products are sold by Archer's Hobby World, 18320 Ward Street, Fountain Valley, CA 92708.

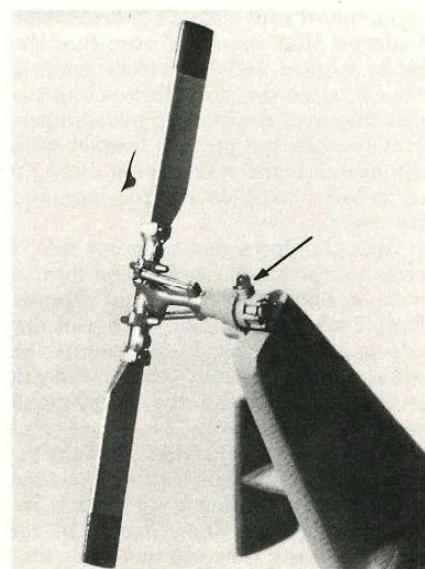
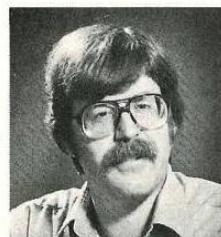


Fig. 8. The lens on the light at the rear rotor assembly is made from Microscale Kristal-Kleer dyed with food coloring.

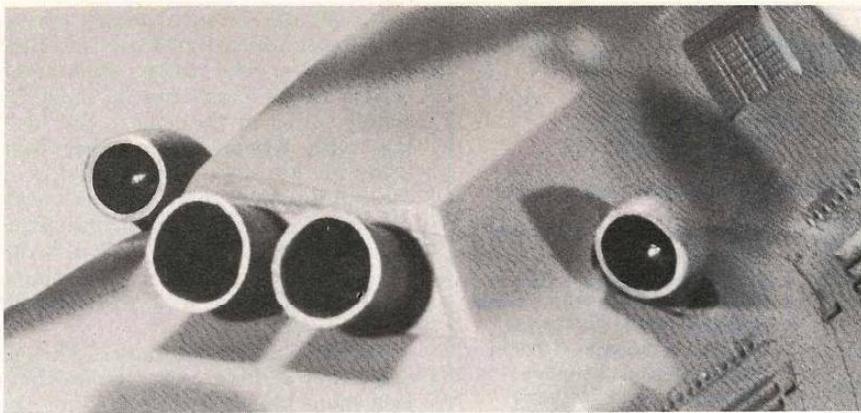


## Meet Dennis Moore

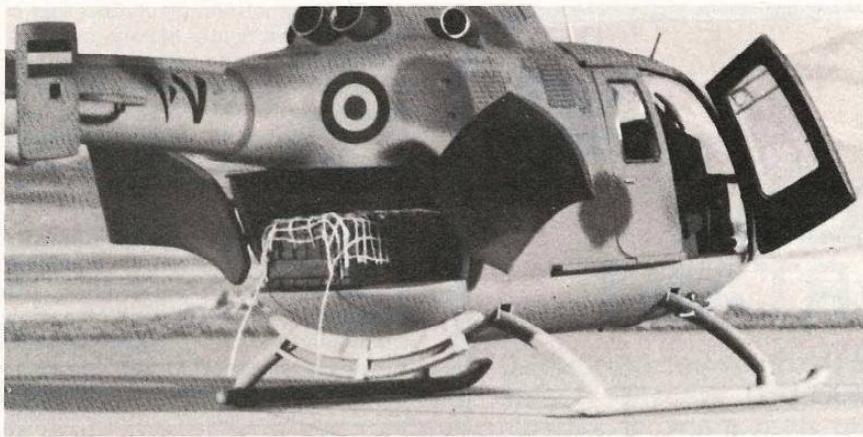
Dennis Moore is a graduate of the University of Wisconsin-Milwaukee with a master's degree in United States diplomatic history. He is chairman of the social studies department at Franklin High School, in Franklin, Wisconsin, a suburb of Milwaukee.

His aircraft and ships have brought him many awards in invitational, regional, and national IPMS competitions; a first grand prize in the Milwaukee Navy Contest; and the judges' advanced category best of show in the 1981 Manitowoc Maritime Museum's ship modeling contest.

Dennis is also active in the Richard I. Bong Chapter of IPMS, Milwaukee.



**Fig. 9.** Dennis hollowed out the four exhaust pipes, applied Bronze Liqu-a-plate to their exteriors, and painted the insides with Polly S Exhaust Black.



**Fig. 10.** The cargo net is a piece of gauze bandage painted khaki.

curling. Don't use Solvaset or Micro Set: E.S.C.I. decals react unpredictably to solvent-type setting agents.

The Arabic numbers are from Microscale (set No. 72-102, MiG 17 and 19), applied using the Microscale system explained on all Microscale sets. Once the decals dried, I washed them and oversprayed the entire aircraft with Micro Flat, taking care to get as little as possible on the main rotor mount.

**Windows.** Before installing any of the windows, make sure that they are free of scratches or abrasions. If there is a problem, first sand the damaged area with No. 600 wet-or-dry sandpaper used wet, then buff with a Q-tip and a plastic polish such as Blue Magic. To simulate the tinted windows, I applied a thin coating of Sobo (a white craft glue sold in most craft stores and many hobby shops) mixed with water and blue food coloring over the underside. Don't add too much coloring or the mix will dry opaque: You want just a hint of blue.

After painting the plastic louvers in the front door windows white, you can mount all of the side windows and drop the cabin top into place. This piece does not fit as well as it should, so I used an abrasive tip in my motor tool and some

careful sanding to bring about an acceptable panel line, then touched up the camouflage in the area.

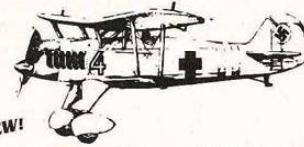
Before gluing the front bubble into place, paint the outside front panel and the support frames Pactra International Colors RLM Gray, then overspray with the exterior color. When viewing the front panel and frames through the open doors, you will be looking at the correct interior color through the clear plastic.

**Exterior details.** The front bubble sports a windshield wiper, Fig. 7, which should be attached with Elmer's to prevent crazing the plastic. The small motor for the wiper was constructed from a piece of styrene sheet, and a piece of painted sprue for the power cable. When you attach the bubble to the fuselage, be sure to align it so that the frames look right from all angles. Once again, use Elmer's because it will give you time to position the part correctly before the glue sets.

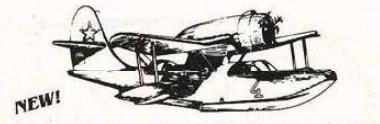
I drilled two small holes in the roof of the flight compartment for the topside antennas, and another at the back of the tail radio dome. Instead of using the antennas that came with the kit, I replaced these pieces with stretched sprue painted white.



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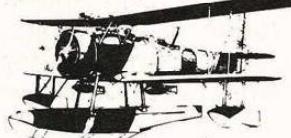


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The BO 105 carries a number of running lights which I made out of Micro Kristal-Kleer. The landing light on the bottom of the plane can be made by simply filling in the hole in the fuselage with Kristal-Kleer rather than using the kit piece. The two lights on the tail fins were made by first painting the tips of the light shafts silver, then covering the paint with Kristal-Kleer. The other lights are all colored using food coloring mixed with Kristal-Kleer, Fig. 8.

All four exhaust stacks need various degrees of drilling out to make them look more like pipe, Fig. 9. Over the years I have developed a fondness for dental burrs for this task, probably because they come in many sizes and are designed for hollowing out areas. I obtain used burrs from my dentist; they're also sold by all dental supply houses.

After drilling and sanding, I sprayed the pipes with Liqui-a-plate Bronze to obtain a scorched look. The insides were hand painted with Polly S Exhaust Black after the Liqui-a-plate had dried. Once painting is finished, the stacks can be installed.

**Doors, mirror, and cargo.** To install the flight compartment doors and cargo bay doors I tacked them in place with two small pieces of electrical tape (they look like hinges) and propped the doors at the correct height with blocks of wood and anything else that was handy. Then, I painted Elmer's into the seam between the fuselage and the door frame and made door handles from stretched sprue, gluing them in place with diluted Elmer's. Because white glue forms a weak bond with styrene, if you don't like the alignment of any of the doors after they are in place, you can break them loose and scrape the glue off for another try. After the glue had dried, I painted over it with Pactra International Colors RLM Gray.

Some BO 105s are equipped with large rearview mirrors on the copilot's side of the fuselage, Fig. 7. I made the mirror assembly from three pieces of sprue and a small piece of paper painted silver to simulate a mirror, attached the assembly with Elmer's, and painted the supports the color of the front bubble frame.

For the cargo, Fig. 10, I used a Bandai 1/48 scale crate; the cargo net was made from a piece of Johnson & Johnson gauze. I airbrushed the gauze Pactra Khaki before cutting it; the paint helps keep the gauze from coming apart. The crate was painted Pactra USA Dark Green and the gauze molded over it. I glued scrap threads of gauze to each corner of the net after it had dried to simulate tie-downs.

To complete the model I attached the air spoiler, main rotor, and tail rotor. The result is an unusual — and unusually attractive — addition to my aircraft collection.

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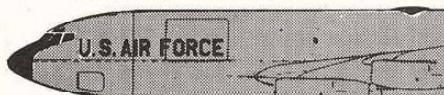
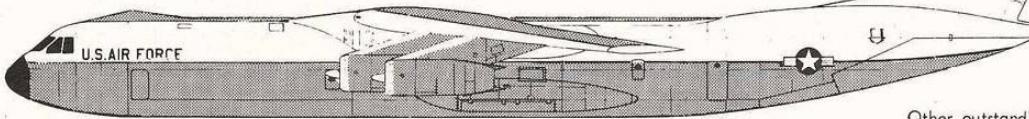
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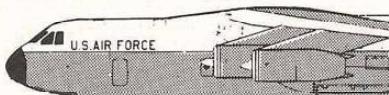
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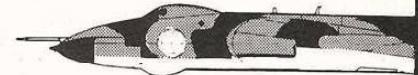


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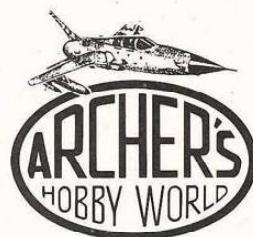
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**Canada's Flowers: A History of the Corvettes of Canada, 1939-1945**

Thomas G. Lynch has prepared a history of Canadian corvettes in World War Two. It is a 100-page, 8 1/4" x 10 1/8", soft-cover book which details the convoy escort and antisubmarine warfare activities of these small vessels in the North Atlantic, the Mediterranean Sea, the English Channel, and other theaters. The book is useful to modelers because it contains 142 black-and-white photos, numerous drawings and plans, and a chart showing how to mix Humbrol enamels to match Canadian WWII colors.

*Canada's Flowers* is published by International Graphics Corp., 218 Beech

Street, Bennington, VT 05201. It costs \$8.50, plus \$1.00 for postage and handling if ordered from the publisher.

**B-17 Flying Fortress in Detail & Scale, Part 1**

Bert Kinzey's Detail & Scale books, of which this is the first to be published and distributed by Aero Publishers, Inc., are practical modeling guides to famous aircraft. *B-17 Flying Fortress in Detail & Scale* by Alwyn T. Lloyd and Terry D. Moore describes the B-17 from the first prototypes through the B-17G.

In addition to 145 photos (10 in color), there are five-view drawings in 1/144 scale of each variant of the B-17, extracts from Boeing manuals, charts and tables, kit reviews, a list of decal sets, and a bibliography.

This is a 72-page, 8 1/2" x 11", soft-cover book printed on good paper.

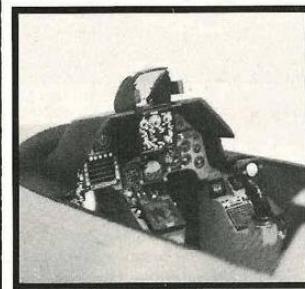
The book sells for \$6.95 and is available in many hobby shops and bookstores, or you may order directly from Aero Publishers, Inc., 329 West Aviation Road, Fallbrook, CA 92028. If you order by mail, add \$1.00 for postage and handling.

**F-4 Phantom II in Detail & Scale, Part I**

Bert Kinzey plans to publish three volumes on the F-4, eventually covering all Phantom variants used by the U.S. military. The first volume covers Phantoms F-4C, F-4D, and RF-4C. Its

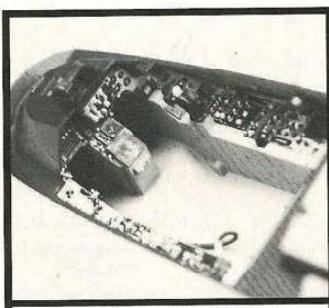
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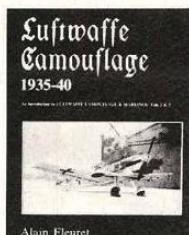
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format is identical to the B-17 book described above, except that the drawings by Jerry G. Smith are in 1/72 scale.

The price is \$6.95 and you may buy the book locally or directly from Aero, in which case add \$1.00 for postage and handling.

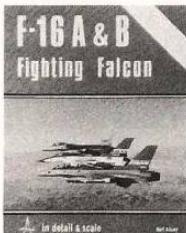


### Luftwaffe Camouflage, 1935-40

The author, Alain Fueret, is president of IPMS/France, an aircraft restoration expert, and an authority on German aircraft. The illustrator, Geoffrey Pentland, is a well-known aviation artist. The two men have produced a 144-page, 8 1/4" x 11 1/8", hard-cover book with more than 330 photos (some in color) and 13 pages of color paintings.

The book offers a thorough discussion of Luftwaffe camouflage through 1940, and also contains a complete discussion of Luftwaffe insignia and other aircraft markings.

*Luftwaffe Camouflage, 1935-40* is published by Kookaburra Technical Publications Pty., Ltd. in Melbourne, Australia. It is sold in many hobby shops, or may be ordered from Kookaburra's U.S. representative, James B. Haycraft, 214 Kenmark Road, Newark, DE 19713. The price is \$27.95.



### F-16A & B Fighting Falcon in Detail & Scale

The F-16 promises to be a mainstay of U.S. and NATO air forces for many years and it has recently performed well with the Israeli Air Force. This book gives complete coverage of the fighter's development, describes changes between prototypes and production aircraft, and lists modifications to service aircraft. There are more than 150 photographs (39 in color), detailed 1/72 scale five-view drawings, technical data, and information about armament loads.

A modeler's section reviews F-16 kits and decal sets, and there is a bibliography of books and articles about the F-16.

This 72-page book is published by Aero; its price is \$6.95. If you order by mail, include \$1.00 for postage and handling.

### A Modeler's Guide to Ancient and Medieval Ships to 1650

In 64 pages, this 8 1/2" x 11 1/2" book by A. Richard Mansir presents an overview of ancient and medieval shipbuilding practices. There are no plans or scale drawings, so this is not a how-to book, but it does provide an introduction to several major types of sailing ships and may be helpful to a modeler searching for new subjects.

It is published by Moonraker Publications, 24452B Alta Vista, Dana Point, CA 92629. The price is \$10.95.

### The Dremel Guide to Compact Power Tools

Dremel, Division of Emerson Electric Co., Racine, WI 53406, has published this guide by Len Hilts to its line of power tools, including the Moto-Tool, Moto-Lathe, Scroll Saw/Sander, Table Saw, and Disc/Belt Sander. The text is accompanied by more than 600 black-and-white photos and Len Hilts provides much information about how to use and care for all Dremel tools and accessories. The text deals exclusively with Dremel tools, but most of the material applies equally to compact tools from other manufacturers. In soft covers, this 266-page, 6 1/2" x 10" book is available from Dremel and Dremel dealers for \$7.95.

### Gunsips, a Pictorial History of Spooky

This 8 1/2" x 11", 64-page, soft-cover book contains text, 162 black-and-white photos, sketches, and color paintings of aircraft used as gunships in Vietnam. The text is by Larry Davis, the illustrations are by Don Greer. The aircraft covered are AC-47s, AC-199s, AC/NC-123s, AP-2Hs, OP-2Es, OV-10s, AU-23As, and AU-24As.

The book is published by Squadron/Signal Publications, Inc., 1115 Crowley Drive, Carrollton, TX 75006. The price is \$8.95.

### SdKfz 251 in Action

The SdKfz 251 half-track armored personnel carrier was used by German troops on all fronts throughout WWII. There were 4 production models in 23 variants; a total of 12,252 were manufactured.

This 50-page, 8 1/8" x 11", horizontal-format, soft-cover book by Charles Klement with illustrations by Don Greer, contains text, 121 black-and-white photos, 12 color paintings, and numerous drawings that illustrate each model and variant of the SdKfz 251. It is published by Squadron/Signal Publications and costs \$4.95.

### Lancaster in Action

From March 3, 1942, until the end of WWII, the RAF flew 156,000 sorties with four-engine Lancaster heavy bombers. *Lancaster in Action* describes the Lancaster's evolution from the two-en-

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gine Manchester and describes each variant. This 50-page, 8½" x 11", horizontal-format, soft-cover book written by R. S. G. Mackay, with illustrations by Don Greer, contains 105 black-and-white photos, 8 color paintings, and many drawings of the aircraft and accessories. It is sold for \$4.95 by Squadron/Signal Publications.

## Armor in Vietnam

Jim Mesko has produced an 8½" x 11", 80-page, soft-cover book containing text, 193 black-and-white photos, and 9 pages of color paintings by Don Greer, all dealing with the tanks and other armored vehicles used in Vietnam from 1946 through 1975. Included are French weapons of the First Vietnamese War, ARVN equipment of the 1960s and early 1970s, and U.S. Army and Marines tanks and other armored vehicles from 1965 through 1971. There is even brief coverage of Australian and NVA armor.

The text is limited to a general description of the use of armor by the combatants; it does not give detailed battle-by-battle analyses because these are available in many official histories.

The book contains no scale drawings but is useful to modelers because the paintings show numerous color schemes and the photos reveal the ways tanks and other vehicles were modified in the field.

The book is available from Squadron/Signal Publications for \$8.95.

## B-26 Marauder in Action

The Martin B-26 medium bomber achieved top speeds of about 300 mph but only at the expense of a high wing loading, which resulted in long takeoff rolls and made the plane too hot for fledgling pilots. After many training fatalities, the aircraft became known as the "widow maker," a name which followed it throughout WWII. Interestingly, though, the B-26 was the safest bomber in combat over Europe.

*B-26 Marauder in Action* by Steve Birdsall and with illustrations by Don Greer is a 50-page, 8½" x 11", horizontal-format, soft-cover book containing text, 99 black-and-white photos, 10 color paintings, and many black-and-white drawings. Each variant of the B-26 is described. The book is published by Squadron/Signal; the price is \$4.95.

## F9F Panther Cougar in Action

The Grumman F9F Panther single-engine Navy and Marines fighter saw service throughout the Korean War; the Cougar featured swept wings and remained in production until 1958. This 50-page, 8½" x 11", horizontal-format, soft-cover book by Jim Sullivan, with illustrations by Don Greer, contains text, 117 black-and-white photos, 10 color paintings, and many sketches.

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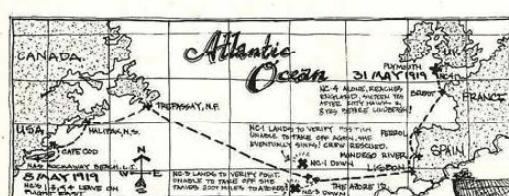
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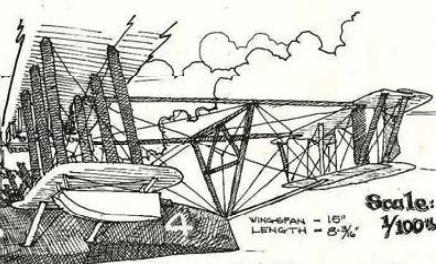
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Each variant of the F9F is described in text and shown in photos. It's published by Squadron/Signal and sells for \$4.95.

#### F4U Corsair in Color

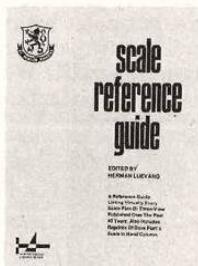
This 32-page, 8½" x 11", soft-cover book by Jim Sullivan contains 7 color photos, 51 black-and-white photos, 16 pages of color paintings by Don Greer, and text which gives a brief history of the development and operations of the Vought Corsair series of fighter-bombers from 1943 through the late 1950s. The color paintings show color schemes and details (including cockpit interiors) for the F4U-1, F4U-4, F4U-5, and F4U-5N.

*F4U Corsair in Color* is available from Squadron/Signal Publications for \$5.95.

#### USAF Europe, 1948-1965, in Color

*USAF Europe, 1948-1965, in Color* is a 36-page, 8½" x 11" large-format, soft-cover book containing 7 color photos, 45 black-and-white photos, and 20 pages of color drawings by the author, Robert Robinson, that show the left or right fuselage sides and tails of USAF fighter-bombers ranging from the F-80 through the F-105. The text consists of brief descriptions of aircraft markings used by a number of USAF groups, wings, and squadrons in Europe from 1948 to 1965. The information is valuable, but the text, photos, and drawings are not keyed to one another, so the book is difficult to use.

It is published by Squadron/Signal Publications; the price is \$5.95.



#### Scale Reference Guide

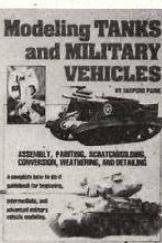
First published in 1976, this bibliography of scale plans and three-view drawings edited by Herman Luevano lists more than 2,800 aircraft drawings published in nine U. S. and British model aviation magazines from the 1930s through 1976 (as well as Profile Publications). Most of the plans listed are for flying scale models, but many of the articles accompanying these plans contain scale drawings of the full-size aircraft and other useful material.

The 117-page, 8½" x 11", soft-cover book is published by *R/C Modeler Magazine*, P. O. Box 487, Sierra Madre, CA 91024, and sells for \$5.50, including U. S. postage. Add \$1.00 for UPS in the U. S. if desired; foreign orders add \$2.00 for book rate postage. **FSM**

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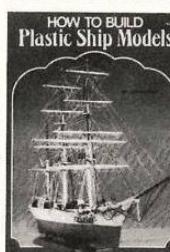
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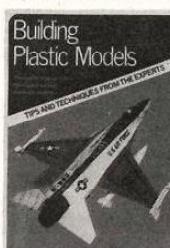
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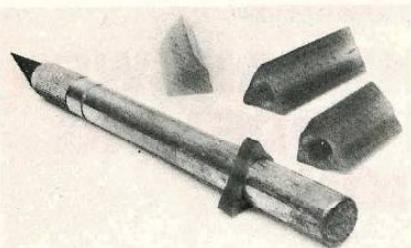
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**Cushion Grips.** It's annoying to work with round-handled tools that constantly roll off your workbench, and, with knives, it's downright dangerous. Here's a solution to the problem: Go to a stationery store and buy several Grip-Rite Cushion Grips made by Hoyle Products, 302 Orange Grove, Fillmore, CA 93015. These are 1 1/2"-long triangular pieces of soft plastic with a hole down the center. They're intended to be used as finger cushions on pencils, but I cut each into several shorter sections and slide the sections onto round handles; they prevent rolling. The grips come in several colors, so they also color-code each tool.

#### Burr Angle

**Scale towing cables.** If you build military vehicles and have been looking for a simple but effective way to make authentic-looking steel towing cables for your models, buy a package of control-line model airplane lead-out wire. This is distributed both by The Perfect Parts Company and by Sig Manufacturing Co. in 4' to 6' lengths and diameters of 0.021" and 0.027"; both sizes contain seven stainless steel strands. The larger diameter is ideal for 1/35 and 1/32 scale models; the smaller looks



good on models down to about 1/48 scale.

When new, the wire is shiny and stiff, but this doesn't present a problem. Simply cut a piece the length you need (I always cut it just a bit longer to be on the safe side!), grip the wire in a pair of pliers, and heat it over a burner on your stove until the wire glows red-hot. This takes the temper out of the metal, making it soft and easily bendable — a side benefit is that the wire turns a realistic rusty-brown color.

The next step is to drill out the cable end-connectors supplied with most armor kits and insert the wire, securing it with a small drop of super glue. Then bend and twist the wire into its correct position.

Dave Musikoff

**Cast-metal texture on styrene.** Many tank parts, such as the gun mantlet on a Soviet T-34 and the turret on an American M48, are made of cast metal, which has a rough finish. However, most kit parts have a smooth finish. Here's one way to achieve a cast-metal look on styrene parts: Gently brush tiny quantities of model airplane dope such as Pactra Aerogloss onto the plastic, let the dope soften the plastic for a



few minutes, then stipple the plastic with a stiff-bristled disposable brush, imparting a rough, textured effect.

Obviously, the more dope you use and the longer you let it work, the heavier the effect will be. If, when you've finished, you feel you've overdone it, you can sand down the surface slightly, but it's best to go slowly and learn through practice when to stop.

**Warning** — dope contains powerful solvents that literally eat styrene. It is easy to ruin an expensive kit if you're not careful, so practice this technique on scrap plastic or an old model before tackling your latest project. Keep in mind, too, that as with most modeling techniques, it's better to be too subtle than to go too far and end up with a curdled mess.

Dave Musikoff

**Plastic cutter.** If you've been looking for a way to cut various shapes from sheet styrene, but don't want to invest in a miniature jigsaw, you might find a suitable alternative in the Wonder Cutter from Snowfoam Products, El Monte,



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**METALIZER**

CA 91734, a device sold in many hobby and craft shops for shaping Styrofoam and similar materials.

A simple tool, the Wonder Cutter uses two D cells to heat a thin but strong wire which is held in a metal frame. Turning on the switch allows the wire to become hot almost instantly, and you can slowly "walk" the wire through sheet plastic as thick as 0.080". Don't force the wire ahead; let the heat do its job, because although the wire is sturdy, it can be broken if too much force is applied.

At only around \$2.98, the Wonder Cutter is a handy tool on your workbench, and clever modelers will find other uses for it. As with any new tool or technique, practice on scrap plastic or a discarded model before attempting "serious" work. *Dave Musikoff*

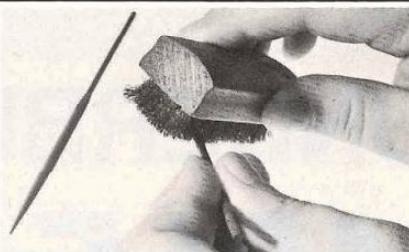
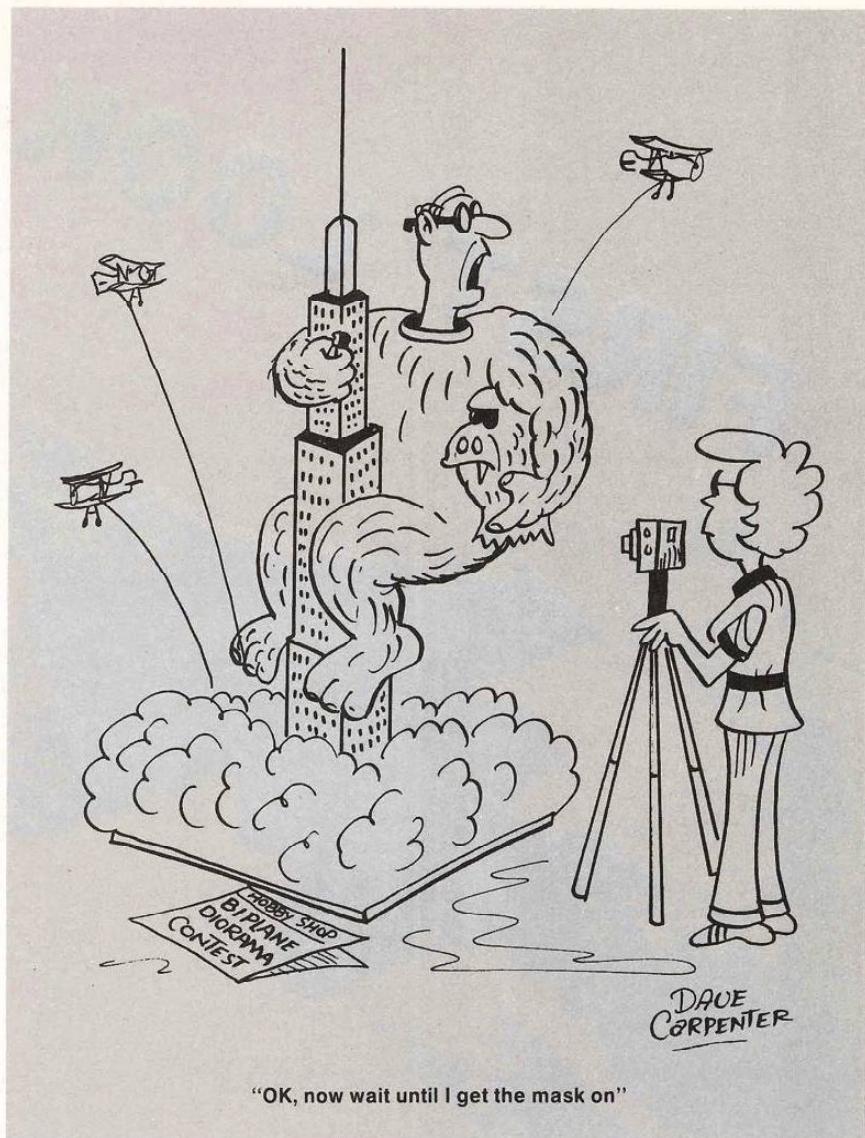
**Dental tools.** If, like many modelers, you feel you can never have enough tools on your workbench, and if "free tools" sounds even better, why not ask your dentist. Yes, your dentist. Have you ever noticed those beautifully made stainless steel probes, picks, and scrapers he uses to such effect? Have you wondered what he does with them when they get old and dull? Fact is, he either tosses them out or returns them to a dental supply house and receives a small credit toward a replacement. As a result, most dentists will gladly give you some of their cast-offs, and you'll find that these little beauties are ideal for all sorts of modeling tasks, from applying tiny portions of putty, to contouring, scraping, and scribing.

So, the next time you make that dreaded trip to your favorite D. D. S., you can at least add a few goodies to the tool chest at the same time!

*Dave Musikoff*

**Keep your files clean.** An economical and effective way to keep tiny modeler's files clean and free from putty buildup is to use a suede brush. These brushes have brass bristles and do a splendid job on the small files we use so often. They're sold in most variety, drug, and grocery stores, often for less than a dollar.

*Dave Musikoff*



#### Surgical tape belts and harnesses.

At one time or another, just about every modeler has searched for a material from which he could manufacture authentic-looking fabric straps, belts, shoulder harnesses, and similar items. Most modelbuilders have settled for that old standby, masking tape, but masking tape usually ends up looking like masking tape in spite of the most



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persistent efforts, and it has an annoying habit of not staying where it's put.

Save the masking tape for masking, and go to any pharmacy or medical supply outlet and buy a roll of surgical tape — not adhesive tape, surgical tape! Several brands are available; the most common is 3M's Micropore, and you can choose from several widths. It has an effective woven look, is thin and pliable, takes paint well, and adheres to most clean surfaces. When cut with a sharp blade, it retains clean edges. At about \$2.50 a roll, it's a fabulously useful item.

Dave Musikoff

**Drawing pencils.** The next time you are in an art supply store, check out their stock of colored drawing pencils. These look just like regular lead pencils, but the fillers come in every shade imaginable. Two common brands are Eagle and Venus.

The most useful color I've found is silver. Sharpened like a regular pencil, the silver pencil can be used to give realistic highlights to any object that's supposed to be metal. Try painting a machine gun a dark shade of gunmetal, let it dry, and then carefully touch the raised details, the corners, and other areas with the pencil. With a little practice, you can simulate wear and tear very effectively; one advantage of the pencil over trying the same thing with paint is that if you mess up or overdo the effect, you can simply wet the area with water and rub away your mistakes.

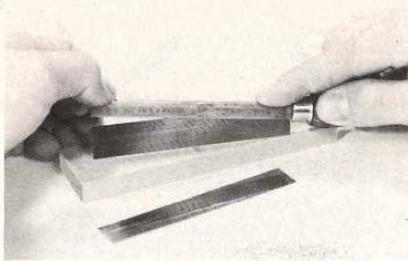
Military vehicle modelers may want to buy a white pencil and try their hands at simulating chalked-on slogans, loading markings, and the like so often seen on such vehicles.

Dave Musikoff

**Tiny electronic components.** If you're the sort of person who likes to install operating navigation lights and instrument console lights in your models, chances are you've discovered that ordinary miniature wire and such components as resistors and potentiometers are far too large. So, where can you obtain such items as super-thin 19-strand hookup wire,  $\frac{1}{8}$ -watt resistors, and subminiature potentiometers? Forget about your local electronics store, and simply wander over to the radio control model section of your hobby shop. Chances are they stock at least some subminiature parts. If you can't find what you want locally, try Ace R/C, Inc., Box 511, 116 West 19th Street, Higginsville, MO 64037. The firm's 1982 catalog (\$2.00) lists hundreds of subminiature parts.

Burr Angle

**Reversed blades.** Razor saw blades are usually installed so that the blade cuts on the push stroke. If you would feel more at ease with a blade that cuts on the pull stroke (as do many other handsaws), simply pry the blade from



the U-shaped metal channel that serves as the blade holder, and reverse the blade. Mark the handle with a piece of colored tape so you can distinguish this saw from others.

Burr Angle

**Beeswax.** In the old days, I lubricated saw blades and drills with Vaseline when working with styrene and plexiglass. This kept the blades and drills from sticking to the work and increased the life of the tool. The only difficulty was that Vaseline, a petroleum-base material, left greasy deposits that had to be washed away. One day a

friend suggested beeswax as a lubricant for blades and drills. I tried it and it works great. It's easier to use and because less is required, cleaning up is not as big a chore. A small cake of beeswax lasts for years and you can buy it at any fabric store or art supply store.

Burr Angle



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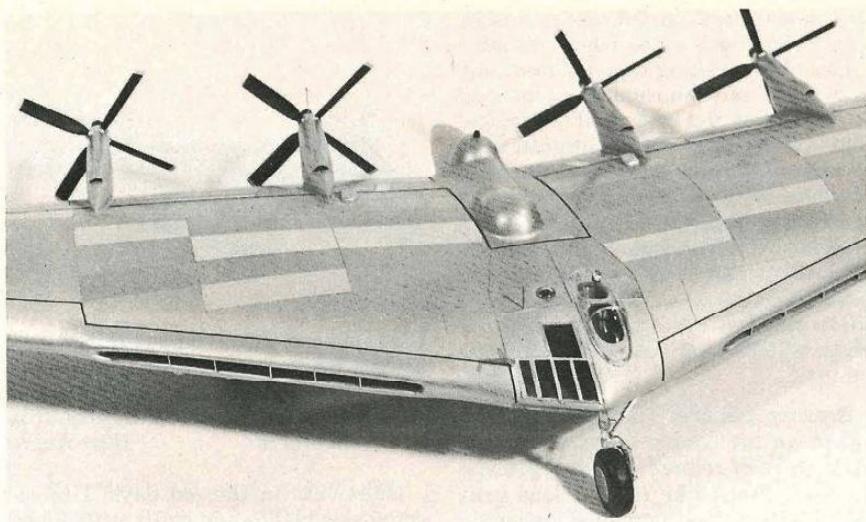
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A Career Job Opportunity

FINESCALE MODELER magazine has an opening for an Associate Editor. This is a full-time career opportunity for the person with the requisite background, abilities, and personality. The person hired will work on the production of FINESCALE MODELER and on related scale modeling books.

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Send a resume and samples to Bob Hayden, Editor, FINESCALE MODELER, 1027 N. 7th Street, Milwaukee, WI 53233 not later than October 11, 1982. Kalmbach Publishing Co. is an equal opportunity employer.



**Two tips for vacuum-form modelers.** I used to remove the lip left on vacuum-formed parts after they've been cut from the sheet with a hand-held sanding block and medium- or coarse-grit sandpaper. While satisfactory, this was time-consuming and messy. Recently, I've taken to using a 1" bastard file (which must be new) to file down the lip until it's almost transparent, and then using a sheet of 220-grit wet-or-dry sandpaper held flat against a piece of mirror tile to remove the rest of the lip. This is faster, not quite as

messy, and gives me much better control.

Because I often build models such as the 1/72 scale Northrop XB-35 Flying Wing shown that have parts larger than 12" long, I feel I could achieve even better results if I had sheets of wet-or-dry sandpaper larger than the standard 9" x 11". Does anyone know if such larger sheets are available?

When detailing cockpits, I've found that dress snaps, sold in fabric stores, make excellent control yokes. The snaps usually require only minor modifications.

Alan C. Griffith

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**Transporting models.** FSM asked Joe Gianfrancesco to ship us a completed model so that we could take studio photos of it for use in an upcoming article. Joe lives in Salt Lake City, and was faced with the problem of sending a delicate aircraft model all the way to Milwaukee. Here's his solution: He first found a flat-sided Styrofoam box (a lot like a six-pack carrier) a few inches larger in all dimensions than the model. He then cut small blocks of foam rubber and polyurethane seat cushion material with which he lined the bottom of the box. He cut other blocks to support the model by its wing tips and horizontal stabilizer tips and placed the model on these blocks. Yet more blocks went between the tops of the wing and horizon-

tal stabilizer tips and the top of the box. These were slightly compressed when Joe put on the lid, ensuring the model could not shift about. He sealed the lid with filament tape.

The plane survived a 1455-mile journey with absolutely no damage, and because the packaging materials are reusable, we'll pack the model in them when we return it.

Burr Angle

Would you like to share information on a useful tool or technique with other FSM readers? Send a brief description of the tool or technique and a black-and-white photo or a pencil sketch to **FSM Tips**, FINESCALE MODELER, 1027 North Seventh Street, Milwaukee, WI 53233. Please enclose a stamped, self-addressed envelope.

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**CLOSING DATE:** Fall issue closes July 15.

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#### EVENTS

**October 16, 1982:** IPMS Region IV Invitational '82 at the Metro-Airport, Ramada Inn, Detroit, Mich. For further information and additional specifics, please write: Mr. David N. Cunningham, P. O. Box 2445, Dearborn, MI 48123.

**October 22-24, 1982:** IPMS-New Jersey Midcon, Halbram Plaza, Pennsauken, N.J. Theme: Korea. Registration: \$10 (\$2 per person walk-in). Banquet: \$15. Contact: Midcon Registrations, c/o Mike O'Connor, 112 Wall St., W. Long Branch, NJ 07764.

## LOCAL HOBBY SHOP DIRECTORY

### TELL YOUR HOBBY RETAILER YOU SAW HIS AD IN FSM

Local Hobby Shop Directory listings are available for the next eight issues for \$110 (payable in advance) or for the next four issues for \$60 (payable in advance), or at \$15 per issue (minimum of four insertions). Ads will be set in standard listing typography. All insertions must be consecutive and may be charged if you have credit established with us. No mention of mail order business or area code permitted.

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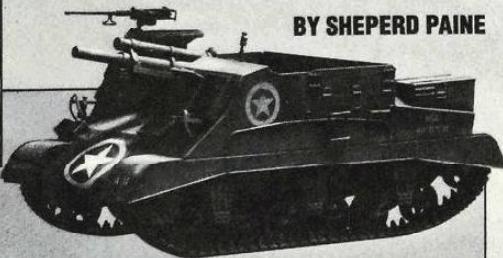
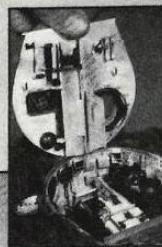
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